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**The Role of Attachment in Paranoia: An Examination of the Impact of  
Attachment Imagery in Attenuated Paranoia and Preliminary Investigation in  
Clinical Participants**

By

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Thesis for the degree of Doctor of Clinical Psychology

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## ABSTRACT

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**The Role of Attachment in Paranoia: An Examination of the Impact of  
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A narrative review of the literature examined the relationship between adult attachment style and paranoia in clinical and non-clinical populations. A total of 18 studies (9290 participants), published between 2006 and 2017 met inclusion criteria. There was evidence found for an association between insecure attachment styles in adulthood and symptoms of paranoia across non-clinical and clinical samples. The direction of this relationship is unclear due to a lack of experimental and longitudinal studies, but is likely to involve multiple complex factors. Other findings indicate that the relationship may be symptom specific and suggest potential differences in attachment style between clinical and healthy populations. Methodological limitations and implications of the findings are discussed, with suggestions made for future research.

In two empirical studies, the effect of attachment-based imagery interventions on paranoia symptoms and distress are explored. Study one investigated the feasibility and impact of an online attachment-based imagery task in individuals with high levels of sub-clinical paranoia, over a seven-day follow-up. The findings reveal that the week-long online imagery intervention was not feasible and a single-administration of the intervention had no effect on symptoms. Study two investigated the impact of secure attachment imagery on two individuals with clinical levels of paranoia using a single-case series design. The results provide the first evidence for the effectiveness of secure attachment imagery in reducing paranoia and distress in a clinical population. Implications of the findings and suggestions for future research are discussed.

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## Declaration of Authorship

I, Cathryn Pitfield, declare that this thesis entitled *The Role of Attachment in Paranoia: An Examination of the Impact of Attachment Imagery in Attenuated Paranoia and Preliminary Investigation in Clinical Participants* and the work presented in it are my own and has been generated by me as the result of my own original research.

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. The data from Study Two has been presented at conference.

Signed.....

Date: .....

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## Abbreviations

CBT CFT	Cognitive Behavioural Therapy Compassion Focussed Therapy
EIP CMHT	Early Intervention in Psychosis team Community Mental Health Team
RQ ECR  PAM ESM AAQ AAI RSQ	Relationship Questionnaire Experiences in Close Relationships Questionnaire Psychosis Attachment Measure Experience Sampling Method Adult Attachment Questionnaire Adult Attachment Interview Relationship Scales Questionnaire
PANSS PDS PS SLC-90 R CAPE  SSI GPTS PC PaDS UM-CIDI	Positive and Negative Syndrome Scale Paranoia and Depression Scale Paranoia Scale Symptom Check List 90-R Community Assessment of Psychic Experiences Schizotypal Symptoms Inventory Green Paranoid Thoughts Scale Paranoia Checklist Persecution and Deservedness Scale University of Michigan Composite Intervention
DASS PANAS	Depression, Anxiety, Stress Scale Positive and Negative Affect Scale
DSM-IV NICE  BPS ICD-10	Diagnostic and Statistical Manual -IV National Institute for Clinical Excellence British Psychological Society International Classification of Diseases - 10

# **Chapter 1: Literature Review. What is the Relationship Between Adult Attachment Style and Paranoia?**

*“Paranoia is something I have been dealing with for my entire life. I always feel as if everyone is laughing at me and talking about me behind my back. I feel as if I can’t trust anyone in my life, including my own family. For a while I couldn’t leave my own home. It’s also made me lose a lot of friends and I am constantly depressed.” (Kay, 2012).*

## **1.1 Introduction**

### **1.1.1 Impact of psychosis.**

Psychosis is a term that refers to a group of severe mental health conditions, including schizophrenia, that are associated with impaired thinking, emotions and behaviours, whereby an individual loses contact with external reality. It is characterised by positive, negative, and cognitive symptoms. Positive symptoms are changes in thoughts and emotions that add to an individual’s experience and include hallucinations and paranoia. Negative symptoms are changes that take away from a person’s experience such as, flat affect and loss of interest and pleasure in activities. Cognitive symptoms relate to other difficulties such as poor attention, working memory and executive functioning (National Institute of Mental Health, 2018).

The prevalence of psychosis in England in one year is estimated at 4 in 1000 people (Kirkbride et al., 2012). One of the most researched diagnoses, schizophrenia, has a significant impact on multiple aspects of an individual’s functioning and is estimated to fall in the top 15 conditions resulting in disability in the UK (Murray et al., 2013). It is associated with experiences of social isolation and stigma (Rose et al., 2011), estimated employment rates of only around 8% (Schizophrenia Commission, 2012), and physical health problems which contribute to increased mortality rates (Brown, Kim, Mitchell, &

Inskip, 2010). In conjunction with the detrimental impact on individuals' quality of life, the economic impact is high, with estimated costs in England during 2004/2005 around 6.7 billion pounds (Mangalore & Knapp, 2007).

Further understanding around risk factors for the development of psychosis could lead to; the introduction of preventative public health strategies, more robust assessment and early detection of symptoms, and the development of more effective psychological interventions. Subsequently we could see lower rates of psychosis symptoms and less severe symptoms, resulting in reduced impact on an individual's well-being, physical health and capacity to engage in employment and relationships. Thus, developing our theoretical understanding of psychosis could be beneficial at both an individual and societal level.

Despite the longstanding practise of diagnosis within this field, considerable heterogeneity remains across, and within, psychotic disorders. It is possible for two people with a diagnosis of Schizophrenia to have no symptoms in common, which has implications, not only for conceptual understanding of these conditions, but also for appropriate treatments. Individuals with different presentations are likely to require different treatments. As a result, there has been a conceptual shift away from broad diagnostic concepts towards understanding specific symptoms (Kinderman & Cooke, 2000).

### **1.1.2 Continuum of paranoia.**

Paranoid ideation is one of the hallmark symptoms in psychosis. Paranoid delusions refer to an individual's belief that others will cause them harm and that this harm is intentional (Freeman & Garety, 2000).

It is widely accepted that paranoia exists along a continuum from non-clinical to clinical experiences (Elahi, Perez Algorta, Varese, McIntyre, & Bentall, 2017; Van Os, Hanssen, Bijl, & Ravelli, 2000), with estimates that paranoia occurs in around one third of the population, and a hierarchy of paranoid delusions developed, ranging from social evaluative concerns to beliefs about severe threat of harm (Freeman et al., 2005).

Interestingly, sub-clinical positive symptoms, such as high sub-clinical paranoia, may constitute a prodromal stage in psychosis (Fusar-Poli et al., 2013; National Institute for Health and Care Excellence, 2014; NICE), and therefore a risk factor for developing clinical symptomology. The finding that paranoia symptoms occur on a continuum is indicative that non-clinical and clinical symptoms may be maintained by common underlying psychological processes and thus it could be advantageous to examine the full range of experiences (Elahi et al., 2017).

Both clinical and non-clinical paranoia symptoms have been associated with poor social functioning, poverty, physical ill-health, co-morbid mental health conditions, increased suicidal ideation, and greater use of mental health services (Freeman et al., 2011). Therefore, it is hoped that through improving understanding of specific symptoms such as paranoia, more targeted and effective interventions can be developed, which would not only benefit patients but also mental health services and reduce the wider economic impact.

Overall, paranoia, a key symptom in psychotic disorders, has a significant impact for both individual's and society. Paranoia is now conceptualised as a continuum of experiences and therefore there is value in exploring these symptoms in both clinical and non-clinical populations.

### **1.1.3 Current treatment for psychosis and paranoia.**

The current psychological understanding of paranoia is dominated by cognitive models which emphasise the role of interpretation of anomalous events (Freeman, Garety, Kuipers, Fowler, & Bebbington, 2002; Garety, Kuiper, Fowler, Freeman, & Bebbington, 2001; Morrison, 2001). Cognitive models are theory-driven and account for positive symptoms of psychosis. For instance, the model of Garety et al. (2001) suggests that individuals have biopsychosocial vulnerabilities, such as parental mental health difficulties, which increases the risk of developing psychosis symptoms. The model indicates that subsequent life stressors, such as a bereavement or trauma, can then trigger negative

emotions and cognitive dysfunction/anomalous experience, such as voice hearing. These lead an individual to attribute the events to external causes, which is influenced by cognitive biases, such as jumping to conclusions. As a result, individuals experience positive psychotic symptoms, including paranoid beliefs, such as 'I am being followed.' Maintaining factors, such as behavioural and cognitive avoidance, offer an explanation for ongoing symptoms in spite of contradictory information. The model is clear and accounts for both the development and maintenance of positive symptoms. It allows patients and therapist to work collaboratively to develop a formulation from which interventions are identified, such as addressing cognitive biases. However, negative symptoms are not accounted for within the model and all positive symptoms are explained using the same model. It is also notable that early relationships and attachment styles are not included within this model.

In contrast, the model of Freeman et al. (2002) focused on persecutory delusions and is separated into formation and maintenance cycles. The model is also based on a stress-vulnerability framework and proposes that predisposing factors, such as genetic or social factors, increase vulnerability to developing delusions. Key precipitants/stressors then lead to an individual experiencing a heightened state of arousal, which causes confusion and anomalous experiences. Individuals then aim to search for meaning in these experiences, a process influenced by pre-existing beliefs about the self, others and the world, which leads to a threat belief. The maintenance of this threat belief is influenced by the resulting experiences of depression and anxiety. These negative states create cognitive biases and behaviours that seek to either find confirmatory evidence for the threat belief, or to reject disconfirmatory evidence, thus the threat belief is reinforced. However, similar to other cognitive models, it focuses predominantly on current maintenance factors and only briefly mentions possible predisposing/vulnerability factors, such as attachment insecurity.

Research relating to interventions derived from such models has resulted in NICE (2014) recommending the use of Cognitive Behavioural Therapy, alongside family interventions, as a first line psychological intervention for individuals experiencing



symptoms of psychosis (CBTp). However, despite some evidence for beneficial long-term effects of CBTp (e.g. Peters, Joseph, Day, & Garety, 2004), outcomes remain mixed, with several meta-analyses suggesting it has no advantage over other interventions for psychosis, such as psycho-education, supportive counselling and family interventions (C. Jones, Hacker, Cormac, Meaden, & Irving, 2012). For delusions specifically (Mehl, Werner, & Lincoln, 2015) it was found not to be effective in preventing relapse (Lynch, Laws, & McKenna, 2010), and produces only small therapeutic effects (Jauhar et al., 2014). Therefore, it may be that cognitive models offer only a partial explanation and further understanding of factors involved in the development of paranoia is needed.

#### **1.1.4 A potential role for attachment theory in understanding paranoia.**

Cognitive models do acknowledge a role for early experiences in shaping our beliefs/schema about self and others. However, more recently attachment style has been linked to psychosis and paranoia symptoms. The developing evidence base has contributed to a trend in utilising attachment theory to help understand individual's experiences of psychosis (Gumley, Taylor, Schwannauer, & MacBeth, 2014).

Bowlby's (1988a, 1988b) evolutionary theory of attachment posits that humans are biologically predisposed to form attachments, initially observed as a bond with their primary caregiver, to ensure their safety. Infants become distressed and seek close proximity to their attachment figure, who then acts as a secure base from which they can confidently explore the world (Ainsworth, 1991). The attachment system also acts as an emotion regulation device, supporting the infant in learning to manage distress. Different patterns of attachment have emerged across individuals (Ainsworth & Bell, 1970). A sensitive and responsive caregiver creates a secure attachment and the infant is confident to socialise and explore the world. In contrast, unresponsive, insensitive, inconsistent caregivers may create insecurely attached infants who then display a range of attachment behaviours, such as crying or clingy behaviour, in attempts to regain or maintain proximity to their caregiver.

Shaver and Mikulincer (2002) described primary attachment behaviours as ‘security-based’ and are aimed at alleviating distress for the individual and supporting them to build resilience. However, if an individual is insecurely attached and their attachment system is activated, then they may employ secondary attachment strategies with the goal to either; hyperactivate the system, i.e. keep on high alert (associated with attachment anxiety); or to deactivate the attachment system in order to avoid distress and frustration as a result of not being able to seek proximity to a caregiver (associated with attachment avoidance).

The mother-infant relationship has been found to be bi-directional, with characteristics of the infant influencing parental responses and thus impacting on the development of the infant’s attachment style. Kim, Chow, Bray, and Teti (2017) found that infant temperament at 3-months of age moderated the association between maternal emotional availability over the first year of life and infant attachment. In children with disabilities, the interaction between both parent and child factors is found to influence attachment security (Howe, 2006).

Arguably, attachment theory has the advantage of being de-stigmatising for the individual, which is particularly relevant for individuals experiencing psychosis. However, it is often viewed as attributing blame to parents/caregivers (Bolen, 2000). Similarly, attachment theory risks a narrow focus on causal factors at the victim and family level, and fails to acknowledge other critical influences at a societal level (Bolen, 2000).

Depending on the measure of attachment utilised, insecure attachment has been separated into different subtypes including avoidant attachment and anxious attachment. An avoidant attachment style develops from an unavailable caregiver, and the child learns to suppress overt emotional displays to gain comfort from their caregiver. In contrast an anxious attachment style has been proposed to develop from an inconsistent caregiver, who vacillates between a nurturing and intrusive response, leading to a child who is clingy to the parent.

There have been two key approaches to the measurement of attachment style in adults, the narrative and the self-report traditions. The former includes interview measures such as the Adult Attachment Interview (George, Kaplan, & Main, 1985, 1996) and produces categorical results in the form of secure, dismissing, preoccupied, or unresolved attachment styles. In contrast, self-report measures began with Ainsworth and Bell's (1970) three category model which recognises secure, avoidant and anxious attachment styles, but has since been developed into a four-category model (Bartholomew & Horowitz, 1991). This model, depicted in Figure 1, measures attachment along two dimensions; the cognitive dimension (model of self or other) and the affective-behavioural dimension (anxiety or avoidance). According to this model, different measures can relate to different attachment style constructs. There is overlap between the constructs with the insecure attachment styles from the three category model (anxious and avoidant) approximately relating to preoccupied and dismissive attachment respectively, and the unresolved attachment from the AAI, suggested as relating to fearful attachment in the four-category model.

		<u>MODEL OF SELF</u> (Anxiety)	
		Positive (Low)	Negative (High)
<u>MODEL OF OTHER</u> (Avoidance)	Positive (Low)	<b>SECURE</b> Comfortable with intimacy and autonomy	<b>PRE-OCCUPIED</b> Preoccupied with relationships
	Negative (High)	<b>DISMISSING</b> Dismissing of intimacy, counter-dependent	<b>FEARFUL</b> Fearful of intimacy, socially avoidant

*Figure 1.* Bartholomew & Horowitz (1991) four-category model of adult attachment

A key criticism of the attachment literature is the difficulty in the measurement of attachment, as a result of a lack of construct parity across measurements, which remains a particular issue with self-administered measures (Bolen, 2000).

The measurement of attachment in the context of psychosis can be challenging. Psychotic symptoms have been found to confound the Adult Attachment Interview (AAI; Dozier, Stovall, & Albus, 1999). Similarly, interpersonal difficulties associated with psychosis mean many self-report attachment measures, with items which refer to romantic relationships, are less relevant in this population (Berry, Wearden, Barrowclough, & Liversidge, 2006). Cognitive difficulties are often a key feature of psychosis (Reichenberg et al., 2008) and may impact an individual's ability to comprehend complex items with negative wording and Likert scales with wider ranges. Therefore, Berry et al. (2006) developed the Psychosis Attachment Measure (PAM) in order to address these problems, with a 4-point Likert scale, positively worded items, and items referring to general relationships instead of intimate partner relationships only. The PAM was found to have good psychometric properties, with good internal consistency (Gumley, Taylor, et al., 2014) and concurrent validity as tested against the Relationship Questionnaire (Berry et al., 2006). Nonetheless, Gumley, Taylor, et al.'s (2014) systematic review of 21 papers concluded that there was good support for the construct validity of attachment measures in individual's with symptoms of psychosis.

Bowlby (1973) suggests that repeated attachment interactions create mental representations of the self and others, known as internal working models, which guide an individual's expectations, attention and interpersonal behaviours throughout the life-span. As these links are reinforced over time, more stable generalised representations develop. Therefore, these early bonds influence later relationships, beliefs about self, and emotion regulation strategies.

However, understanding the process involved in the continuity of attachment style from early representations to adult attachment patterns, has been debated in the literature. Fraley (2002) examined two models of continuity of attachment; the revisionist perspective, which proposes that existing early representations are updated overtime; and the prototype perspective, whereby early representations are preserved and continue to influence

behaviours into adulthood. Modelling of both theoretical perspectives using meta-analysis data, indicated that the prototype perspective best accounted for attachment stability over a 19 year time period (Fraley, 2002). If we hold this perspective, infant attachment styles are closely related to adult attachment styles and therefore, as Bowlby proposes, continue to influence an individual's behaviour, beliefs about self and others, and emotion regulation skills throughout a life course. Thus, early interactions and associated mental representations within the attachment system could contribute to our understanding of the development of symptoms of psychosis in adulthood.

It could be argued that working models are similar to the concept of core beliefs within cognitive models, and thus one would question what attachment theory could add to our current understanding of psychosis. Berry, Barrowclough, and Wearden (2007) argue that attachment working models include affect processes in addition to beliefs, and in the context of relationships. Nonetheless, it remains unclear how stable these working models are, and what may influence their development and maintenance (Berry, Barrowclough, & Wearden, 2007).

Attachment insecurity has been linked to various psychopathologies including, but not limited to; post-traumatic stress disorder (Ogle, Rubin, & Siegler, 2015), obsessive-compulsive symptoms (Boysan & Çam, 2016), and depression (Shaver, Schachner, & Mikulincer, 2005).

It is argued that an insecure attachment style is a significant contributor to the development of psychopathologies via several pathways (Mikulincer & Shaver, 2012). For instance, a lack of responsive and sensitive caregiving may contribute to a dysfunctional sense of self, with low self-esteem, high self-criticism and defensive behaviours, which increase the risk for developing a mental health condition. Similarly, insecure attachment styles may result in dysfunctional emotion regulation systems, with an avoidant style associated with distress suppression and an anxious style associated with emotion intensification, again increasing the risk of mental health difficulties. It is also hypothesised

that individuals with insecure attachment are at increased risk of developing a mental health condition through their difficulties with interpersonal relationships and the associated social isolation and interpersonal conflict. However, much of the research in the field of attachment theory has been correlational and involves small sample sizes, meaning causality and the strength of the conclusions reported, should be interpreted with caution (Bolen, 2000).

Paranoia is an inherently interpersonal set of experiences, relating to worries about threats from others, linked with significant anxiety and distress. Therefore, it is possible that attachment theory may be able to enrich our understanding of these symptoms. For instance, attachment theory could offer; an explanation for the interpersonal difficulties experienced by individuals with symptoms of psychosis, understanding of the role of interpersonal events and trauma experiences in the development and maintenance of symptoms, and an understanding of the effects of therapist and patient attachment styles in the formation of the therapeutic relationship.

In a study of individuals with psychosis, 68.5% had an insecure attachment style, as assessed by the Adult Attachment Interview (Gumley et al., 2014). In contrast, Bucci, Emsley, and Berry (2017) found the most common attachment style in individuals with psychosis was secure attachment, although disorganised attachment was associated with more severe symptoms. The discrepant findings could be the result of the use of different assessment methods for attachment style, with the former using a semi-structured clinical interview, and the latter using a self-report questionnaire.

In a comprehensive narrative review of 16 studies Berry, Barrowclough, and Wearden (2007) suggested that insecure attachment style impacts the development of psychosis, through the resulting negative beliefs and dysfunctional affect regulation strategies. However, the review acknowledged methodological limitations across the studies including; small sample sizes, a reliance on cross-sectional designs and differences in the measurement of attachment. In an extension of their transdiagnostic model of attachment and psychopathology, Ein-Dor, Viglin, and Doron (2016) propose that attachment anxiety is

a risk factor for developing schizophrenia, mediated by higher negative affect, increased hypervigilance to threat cues, and low perceived responsiveness from others. Whilst the ideas presented in the transdiagnostic model may have good face validity, they are based on limited research evidence and the model itself is currently untested.

There is increasing evidence linking attachment insecurity to specific symptoms in psychosis (e.g. Korver-Nieberg, Berry, Meijer, de Haan, & Ponizovsky, 2015). Harder (2014) proposes an attachment-based model of risk mechanisms in the development of psychosis, whereby disorganised and avoidant attachment styles result in differential processes such as heightened stress-sensitivity, which are then linked to the development of different symptoms. This model requires robust testing but implicates involvement of various attachment styles in psychosis and indicates pathways for specific symptom development. For instance, disorganised attachment is linked to experiences of dissociation, which link to positive psychotic symptoms such as hallucinations.

Advancing knowledge of psychological processes associated with the development and maintenance of paranoia is in line with NHS England's current five year forward plan for mental health (Mental Health Taskforce, 2016). The report highlights the role of innovation and research, and specifically identifies key priorities for mental health including prevention of mental ill-health, and increased understanding of causal mechanisms, in order to inform the development of new and more effective interventions. A greater understanding of the role of attachment style in the development and maintenance of paranoia may contribute to improved outcomes for this group.

Several previous reviews have examined attachment in relation to psychosis, although none have focused on specific symptoms. In an early narrative review Berry, Barrowclough, and Wearden (2007) concluded that attachment theory has significant potential to contribute to our theoretical understanding of psychosis. The review highlighted evidence for a link between avoidant attachment and paranoia; however, the focus was on psychosis as a broader diagnosis with limited examination of individual symptoms. Whilst

the review examined 16 papers, only seven of these used a direct measure of attachment. The additional nine papers were a selection of papers that explored parental bonding, which refers to childhood memories relating to attachment and is not a specific measure of adult attachment. Furthermore, of the seven studies that used a direct attachment measure, five were conducted by one group of researchers. Importantly, the majority of samples within these studies included a range of diagnoses, weakening direct conclusions drawn in relation to psychosis. However, the review provides an excellent base from which future research can build with clear clinical implications identified, including the contribution of attachment theory to our understanding of; how different interpersonal styles may impact on patient engagement, important elements of the therapeutic relationship, and a suggestion that interpersonal experiences can change attachment working models.

In a more recent systematic review of attachment in psychosis, small associations were found between insecure attachment and an increase in symptoms of psychosis (Gumley et al., 2014). The authors also report ‘good evidence’ for a relationship between positive psychosis symptoms, which includes paranoia, and attachment avoidance; although this is based on results from only six studies. Out of 21 papers, seven were also included in the 2007 review. The review primarily focused on the measurement of attachment and the construct validity of different measures in psychosis, resulting in limited exploration of specific symptoms including paranoia.

In the same year another systematic review, exploring attachment and psychosis in clinical and non-clinical populations, found that both anxious and avoidant attachment were associated with psychosis symptoms (Korver-Nieberg, Berry, Meijer, & De Haan, 2014). There were mixed findings reported for a specific association between paranoia and attachment classification; however, only six papers examining this relationship were described. One study in a clinical population found that avoidant attachment was positively associated with paranoia; whilst a second found no relationship. In non-clinical samples, three studies found both avoidant and anxious attachment were related to paranoia



symptoms; whilst another found only anxious attachment was related. The authors hypothesise that discrepancies could be due to differences in measures and statistical analyses used, as well as small sample sizes. The overlap between reviews is evident with approximately 17 of the 29 studies examined in this review also found in both other reviews (Berry et al., 2007; Gumley, Taylor, et al., 2014).

The current review aims to extend the findings of previous reviews with a focus specifically on paranoia, in line with the conceptual shift to examining individual symptoms in psychosis, and also in recognition that different symptoms may be differentially associated with specific attachment styles. The review will draw on the strengths and limitations of previous reviews with the inclusion of non-clinical and clinical samples, and the exclusion of studies which use inferred measures of attachment, such as parental bonding. It will be the first review to examine the relationship between adult attachment and paranoia symptoms specifically. In addition, as previous reviews only included studies published up to 2012 and there has been increasing interest in the role of attachment in psychosis, the review aims to update current understanding with more recent findings.

#### **1.1.5 Aims.**

What does the literature tell us about the relationship between adult attachment style and individuals experience of paranoia?

- a) What evidence is there for an association between adult attachment style and paranoia in clinical and non-clinical populations?
- b) What is the methodological quality of this evidence, assessed using a quality assessment tool?

## **1.2 Method**

### **1.2.1 Information sources and search terms.**

Five electronic databases relevant to psychological research (PsycINFO, PsycARTICLES, MEDLINE and CINAHL on EBSCO platform, and Web of Science) were searched in November 2017.

The following search terms were utilised for the search strategy and the syntax was adapted appropriately for each database: (Paranoi\* OR persecutory OR delusion\*) AND (attachment OR “parent\* bonding” OR “early relationship\*”). The relatively broad search terms were defined between the author, supervisors KNT and TM who were researchers and clinicians with special interest in the area, and a University librarian, as an inclusive search approach.

No limits were used within the search strategy, including date of publication or original language of article. A total of 805 records were identified in the initial search. A hand search of previous related review articles (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001; Berry, Barrowclough, & Wearden, 2007; Korver-Nieberg, Berry, Meijer, & De Haan, 2014) and snowball citation searching identified 13 additional records.

### **1.2.2 Eligibility Criteria.**

The following inclusion criteria were utilised in the search:

1. The study was from a peer-reviewed source, to increase the methodological and theoretical quality of papers included.
2. Participants were adolescents or adults, i.e. 13 years old and over.
3. A specific measure of paranoia was used as either a primary or secondary outcome in the study, to ensure there was sufficient data to analyse.

4. A specific measure of adult attachment was included as a primary or secondary outcome in the study.
5. The link between attachment style and paranoia was explored empirically, as opposed to theoretically, with data reported.
6. The complete article was available in English. Limited resources and time precluded the translation of articles into English.
7. Where the study used clinical participants, they had a primary diagnosis or symptomology relating to paranoia, such as a psychosis disorder.

The following exclusion criteria were utilised in the search:

1. Grey literature (unpublished work or non-commercial publications, such as theses, factsheets or government reports) was beyond the scope of this review and therefore was excluded.
2. Conference posters, abstracts, book reviews and proposals were excluded.
3. Studies which explored more general ‘delusions’ such as assessed by the Peters Delusion Inventory (Peters et al., 2004) were excluded.
4. Studies which used a measure of more general attachment-related concepts, such as parental bonding or early relationships, were excluded.<sup>1</sup>
5. If participants had a dual-diagnosis that is likely to have impacted on the outcomes of interest, for instance participants with paranoia symptoms and substance misuse, the study was excluded from the review.

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1. <sup>1</sup> For instance, Manassis, Owens, Adam, West, & Sheldon-Keller (1999) found that although the Parental Bonding Instrument was able to differentiate optimal and least optimal attachment styles, it was unable to categorise attachments, was reliable only in optimal attachment samples, and did not recommend the use of the measure in small, clinical samples.

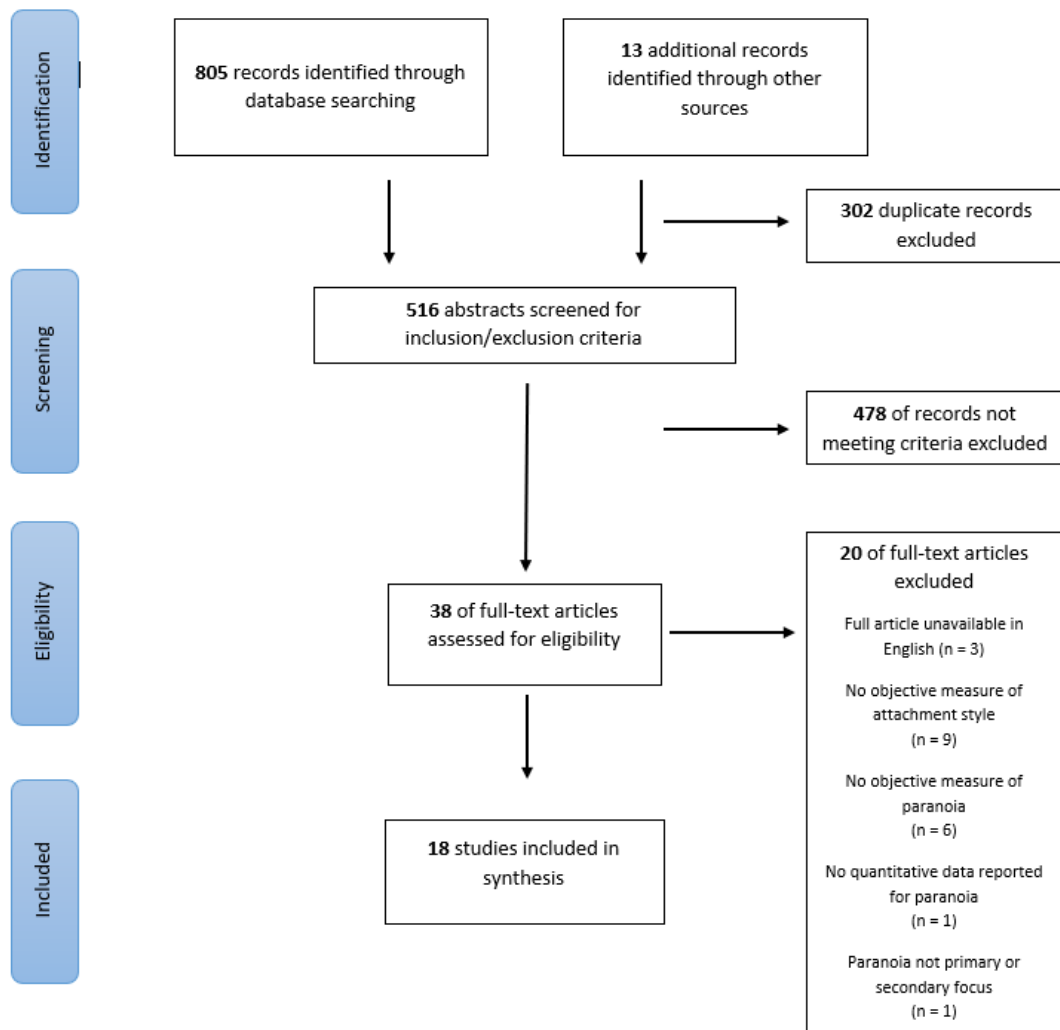
### **1.2.3 Study selection.**

Following study identification, duplicates were removed and all records were screened for eligibility by the lead author using their title and abstract. 38 full-text articles were examined with 18 included in the final review. Figure 2 outlines the process of literature selection, based on the preferred reporting items for systematic reviews and meta-analyses (PRISMA; Moher et al., 2009).

### **1.2.4 Data Extraction.**

Information from the 18 identified studies was extracted in line with the primary aims of the study to include; study design, primary aims, sample population, outcome measures and key findings. A narrative approach was used to synthesise the findings across papers. This approach was selected as it provides a rich amount of information across a range of research designs and contexts. Whilst all of the studies included in the review are quantitative, several do not provide sufficient information to calculate effect sizes, precluding the completion of a meta-analysis. As many of the studies used a correlational design, Pearson's  $r$  effect size would have been appropriate to use as a comparator within a meta-analysis. However; five of the studies within the review reported standardised multiple or hierarchical regression coefficients (beta coefficients) and did not report correlation matrices (Ciocca et al., 2017; Fett et al., 2016; Ponizovsky, Vitenberg, Baumgarten-Katz, & Grinshpoon, 2013; Sitko, Bentall, Shevlin, O'Sullivan, & Sellwood, 2014; Sitko, Varese, Sellwood, Hammond, & Bentall, 2016). Whilst there is some suggestion that beta coefficients can be utilised as an effect size (Rosenthal & DiMatteo, 2001), and more recent proposals that under certain conditions you can assign corresponding correlations from beta coefficients (Peterson & Brown, 2005), this approach is not advocated generally within the literature (Hunter & Schmidt, 1990) and is strongly opposed by some researchers due to evidence that use of estimates from beta coefficients results in large biases (Roth, Le, Oh, &

Iddekinge, 2017). In addition, the heterogeneity across studies, particularly the different approaches to the measurement of attachment indicate the use of a narrative approach.



Adapted from Moher D, Liberati A, Tetzlaff J, Altman DG, The PRISMA Group (2009). Preferred Reporting Items for Systematic Reviews and MetaAnalyses: The PRISMA Statement. *PLoS Med* 6(6): e1000097. doi:10.1371/journal.pmed1000097

Figure 2. Study selection process

The synthesis explored the measures of attachment and paranoia utilised across studies, evidence of an association between attachment and paranoia, and then described key themes relating to the nature of this relationship.

### **1.2.5 Coding of quality.**

The QualSyst quality tool (Kmet, Lee, & Cook, 2004) was utilised to examine the methodological rigour of each study, which is flexible enough to encompass a range of designs. Two subscales are available to assess quantitative and qualitative research designs, although for the purposes of this review only the former scale was required. Each study is rated according to 14 standards assessing areas including; study design, method of subject selection, randomisation, blinding, outcome measures, sample size, analysis, and results. Scoring is on a 0-2 scale, where 0 refers to standard not met, 1 refers to partially met, and 2 if the standard was met. Items that are not applicable are not scored increasing the measure's flexibility. The total score for each paper is calculated as a percentage of the total possible score, meaning scores are comparable across studies.

To increase reliability of ratings, the author and a second-rater (Trainee Clinical Psychologist) independently assessed each paper. Where scores were incongruent, agreement was reached through re-examining the paper and discussion. All reported scores were agreed across raters (Appendix A).

Overall scores ranged from 81% to 95%, indicating limited variation in the overall quality of the studies, perhaps representing similar standards in the field, given all studies published in a peer reviewed journal. Common concerns across papers related to; a lack of appropriate or well-defined method of subject selection, inappropriate analytic methods with many papers not including a correction for multiple comparisons, and a lack of estimates of variance for main results. Such limitations will therefore be taken into consideration when interpreting results of these papers. Nonetheless, all studies received a quality score above the conservative inclusion cut-off score of 75% indicated by Kmet et al. (2004) and were therefore retained in the current review.

As a result, the quality assessment measure demonstrated that studies included within the review were of good methodological quality and was able to identify specific

methodological weaknesses to take into consideration within the results; e.g., considering if differences in methodological quality of the papers may have influenced different findings relating to the association between paranoia and attachment.

## **1.3 Results**

The present review found 18 studies exploring the association between adult attachment style and paranoia symptoms that met inclusion criteria. Table 1 represents a summary of each study examined.

### **1.3.1 Study Characteristics**

Studies within the review were published between 2006 and 2017, possibly reflecting a move over the last decade towards both understanding attachment theory as a contributing factor to psychosis, and towards a focus on specific symptoms instead of psychotic disorders.

All studies within the review were undertaken in developed countries and notably all within the Northern Hemisphere (Figure 3). The majority of studies were conducted in the UK, with 12 out of the 18 studies utilising a UK sample, and a further study examining samples from three different countries; Israel, the Netherlands, and the UK (Korver-Nieberg et al., 2015). Of the studies in the UK that reported sample locations, three were in the South of England and four were in North-West England and North East Wales (Figure 4), close to University towns, which are research hubs. Therefore, the studies within the review are not representative of wider cultural differences across countries and also across UK sub-cultures. This is important given that attachment theory relates to interpersonal experiences, which can vary greatly across cultures. Therefore, the results are not generalisable, for example to other less developed countries.



*Figure 3. Map of study locations*

Seventy-eight percent of studies used a cross-sectional design with only two incorporating a longitudinal design (Berry, Barrowclough, & Wearden, 2008; Sitko, Varese, Sellwood, Hammond, & Bentall, 2016) and two utilising an experimental design (Fett et al., 2016; Hutton, Ellett, & Berry, 2017), limiting the review’s ability to draw conclusions about causation. In addition, only six studies included a control group (Darrell-Berry et al., 2017; Fett et al., 2016; Korver-Nieberg et al., 2013; Russo et al., 2017; Sitko et al., 2016; Wickham, Sitko, & Bentall, 2015).



*Figure 4. Map of reported UK sample locations*



### **1.3.2 Participant characteristics.**

Collectively, 9290 participants are included in the current review, with a mean sample size of 516 (range = 40-550). The majority of studies ( $n = 12$ ) included participants from a clinical or at-risk population; however, this only accounted for 1273 participants from the combined sample. The remaining 86% of participants were from non-clinical populations, which may be reflective of the difficulty in recruiting individuals experiencing clinical levels of paranoia, and also the understanding of psychosis along a continuum (Van Os et al., 2000).

There was a fairly even split across genders, with 54% of the collective sample reported as female, excluding Sitko, Bentall, Shevlin, O'Sullivan, & Sellwood's (2014) study which did not report gender data.

Across 14 studies that reported participants' ages, they were found to range between 13 and 77 years old ( $M = 30.33$  years), and only two studies recruited solely from an adolescent population, i.e. 13-19 years old (Fett et al., 2016; Korver-Nieberg et al., 2013).

Table 1

*Summary of Studies Selected for Review*

Study reference	Aims	Sample	Design	Key outcome measures	Key findings and significance values
Hutton, Ellett, & Berry (2017)	To examine the role of attachment and secure-base attachment priming in paranoid thinking	Non-clinical student population (n = 60; 48 female) 18-25 years (M = 21) UK	Experimental design	Paranoia and Depression Scale Paranoia Scale Experiences in Close Relationships Scale Revised Depression, Anxiety and Stress Scale	Insecure attachment associated with trait (anxiety $p = .002$ , avoidance $p = 0.4$ ) and state (anxiety & avoidance $p < .001$ ) paranoia. Priming secure attachment didn't buffer paranoid thinking in attachment avoidance, and predicted paranoid thinking in attachment anxiety
Ciocca et al., (2017)	To explore the role of defence mechanisms and attachment styles in paranoia	Non-clinical student population (n=550; 389 female) 18-30 years (M = 21.95) Italy	Cross-sectional, correlational	Symptoms Check List- 90 Revised (paranoia scale) Defence Style Questionnaire-40 Relationship Questionnaire (Italian)	Immature defence mechanisms and preoccupied attachment predicted paranoid ideation ( $p < .0001$ ). Higher levels of paranoia associated with preoccupied and fearful attachment ( $p < .05$ )
Pearce et al. (2017)	To investigate if insecure attachment and dissociation mediate the relationship between childhood trauma and symptoms of voice hearing and paranoia	Clinical population (n = 112; 81 female), self-report. 18-72 years (M = 40.26) UK	Cross-sectional	Brief Betrayal Trauma Survey Dissociative Experiences Scale Community Assessment of Psychotic Experiences Relationship Questionnaire (categorical and continuous)	Fearful attachment associated with higher paranoia ( $p < .001$ ). Dissociation mediated link between trauma and voices. Relationship between trauma and paranoia mediated by both dissociation and fearful attachment

Study reference	Aims	Sample	Design	Key outcome measures	Key findings and significance values
Russo et al. (2017)	To explore attachment styles and their relationship with symptomatology in those at ultra-high risk for developing psychosis	At risk population (n = 60; 29 female) and matched healthy controls (n= 60; 34 female) 16-35 years (at risk M = 19.89; healthy control M = 22.60) UK	Cross-sectional, correlational	CAARMS (at risk measure) Psychosis Attachment Measure DSM-IV diagnoses Trauma History Screen Beck Depression and Anxiety Inventories The Schizotypal Symptoms Inventory Brief	Anxious attachment correlated with schizotypy paranoia in UHR population ( $p = .02$ ). In healthy control group insecure attachment correlated with schizotypy paranoia (anxiety $p < .001$ ; avoidance $p = .04$ )
Darrell-Berry et al. (2017)	To explore mechanisms behind anger across the psychosis continuum	Clinical and non-clinical population (n = 174; 104 female). UHR = 14, First episode = 20, established psychosis = 20, non-clinical = 120 Age $\geq 16$ years (M = 23) UK	Cross-sectional, correlational	State-Trait Anger Expression Inventory-2 Green Paranoid Thoughts Scale Positive and Negative Syndrome Scale Psychosis Attachment Measure ToM tasks	Positive correlation between attachment anxiety, attachment avoidance, and paranoia ( $p < .001$ ). Relationship between avoidant attachment and anger partially mediated by paranoia
Castilho et al. (2017)	To examine attachment styles and experiential avoidance in paranoid ideation	Clinical Population (n = 37; 7 female) Outpatients and in-patients Age = 19-52 (M = 37.14) Portugal	Observational, cross-sectional	Acceptance and Action Questionnaire II (Portuguese) Experiences in close Relationships (Portuguese) Paranoia Checklist (Frequency Scale; Portuguese)	Attachment anxiety high across attachment figures. Attachment anxiety to mother correlated with paranoid ideation ( $p < .05$ ) and experiential avoidance ( $p < .001$ ). Relationship between attachment anxiety and paranoid ideation mediated by experiential avoidance

Study reference	Aims	Sample	Design	Key outcome measures	Key findings and significance values
Fett et al. (2016)	To examine interpersonal trust in psychosis and role of attachment style in this relationship, using a trust game	Clinical population, adolescents with early psychosis (n = 39; 17 female) and healthy controls (n = 100; 50 female) Age = 13-19 years (M = 16) UK	Experimental	Green Paranoid Thoughts Scale Positive and Negative Syndrome Scale Wechsler Abbreviated Scale of Intelligence Psychosis Attachment Measure Trust - investments in game	Patients had higher levels of attachment anxiety ( $p = .01$ ). No difference in attachment avoidance ( $p = .2$ ). Attachment anxiety ( $p < .001$ ) and avoidance ( $p < .001$ ) associated with paranoia
Sitko, Varese, Sellwood, Hammond, & Bentall (2016)	To investigate if attachment insecurity is stable or fluctuates, and the relationship between stress, attachment security and paranoia	Clinical population (n = 20; 4 female) from outpatient facilities Healthy control (n = 20; 5 female) Age = clinical (M = 41.05), healthy (M = 35.05) UK	Longitudinal design Experience Sampling Method (6 days)	Positive and Negative Syndrome Scale Relationship Questionnaire ESM paranoia (2 statements rated on 7-point Likert scale) ESM attachment insecurity (6 statements) ESM hallucinations, self-esteem, stress	Fluctuations in attachment insecurity higher in clinical group ( $p < .001$ ). Stress predicted attachment insecurity ( $p = .029$ ), which predicted an increase in paranoia ( $p < .001$ ). Attachment insecurity predicted paranoia when controlling for hallucinations ( $p = .001$ ). No association for hallucinations when controlling for paranoia ( $p > .05$ )
Wickham, Sitko, & Bentall (2015)	To investigate the relationship between attachment, paranoia and hallucinations in schizophrenia, and explore possible mediating role of self-esteem	Clinical population (n = 176; 53 female) EIP and CMHTs Healthy controls, NHS and fire service staff and students (n = 113; 54 female; $M_{age} = 37.73$ ). Age = 17-77 years UK	Cross-sectional, correlational	Multi-Dimensional Locus of Control Scale Relationship Questionnaire Persecution and Deservedness Scale (PaDS) Self-Esteem Rating Scale Positive and Negative Syndrome Scale (PANSS)	Insecure attachment predicted paranoia (anxiety and paranoia PANSS $p < .001$ ; anxiety and PaDS $p < .05$ ; avoidance and PANSS $p < .05$ ; avoidance and PaDs $p > .05$ ) but not hallucinations (avoidance and attachment $p > .05$ ) in patients. Negative self-esteem found to mediate this relationship

Study reference	Aims	Sample	Design	Key outcome measures	Key findings and significance values
Korver-Nieberg, Berry, Meijer, de Haan, Ponizovsky (2015)	To investigate relationships between attachment style and paranoia and hallucinations in a cross-cultural sample	Clinical population (n = 500; 98 female) From 3 studies: Netherlands (n = 92), UK (n=81), and Israel (n = 327) Age = >16 years (M = 37.5)	Cross-sectional, correlational	Relationship Questionnaire Positive and Negative Syndrome Scale	Attachment anxiety was associated with positive psychotic and affect symptoms. Paranoia and hallucinations were associated with attachment avoidance and anxiety in a cross-cultural sample ( $p < .001$ )
Strand, Goulding, & Tidefors (2014)	To examine relationship between attachment style and psychosis symptoms	Clinical population (n = 47; 17 female) from an out-patient mental health clinic Mage = 43.02 Sweden	Cross-sectional, correlational	Relationship Questionnaire Symptom Checklist-90 Revised	Preoccupied attachment was associated with symptom severity. Preoccupied attachment positively associated with paranoia ( $p < .001$ )
Sitko, Bentall, Shevlin, O'Sullivan, & Sellwood (2014)	To explore if attachment style impacted the relationship between adverse childhood experiences and symptoms of psychosis in adulthood	Non-clinical sample from National Comorbidity Study (n = 5877) Age = 15-54 US	Cross-sectional, correlational	University of Michigan Composite Interview - Diagnostic Interview Adult Attachment Questionnaire	Hallucinations were associated with sexual abuse ( $p < .001$ ) and paranoid beliefs with neglect ( $p < .05$ ). The latter relationship was mediated by attachment (anxious and avoidant)

Study reference	Aims	Sample	Design	Key outcome measures	Key findings and significance values
Korver-Nieberg et al. (2013)	To investigate relationships between Theory of Mind, paranoia, and attachment in psychosis	Clinical population, adolescents with early psychosis (n = 32; 12 female) Healthy controls (n = 78; 28 female) Age = 13-18 years UK	Cross-sectional, correlational	Perspective-Taking Task Community Assessment of Psychotic Experiences Green Paranoid Thoughts Scale Positive and Negative Syndrome Scale Psychosis Attachment Measure	Attachment anxiety was associated with social reference paranoia in clinical ( $p \leq .05$ ) and control group. Attachment avoidance was associated with persecutory paranoia in clinical group only ( $p \leq .05$ )
Ponizovsky, Vitenberg, Baumgarten-Katz, & Grinshpoon (2013)	To examine whether insecure attachment styles are differentially associated with symptom severity and distress in schizophrenia	Clinical population (n = 100; 30 female) Outpatients Recruited 18+ years old Mage = 40.3 years Israel	Cross-sectional, correlational	Relationship Questionnaire General Health Questionnaire Positive and Negative Syndrome Scale Dysfunctional Attitude Scale	Preoccupied attachment associated with more severe delusions ( $p < .001$ ) and paranoia ( $p < .001$ ). Fearful-avoidant attachment associated with hallucinations ( $p < .001$ ) and various affective symptoms.
Berry, Barrowclough, & Wearden (2008)	To establish relationship between attachment, psychosis, interpersonal functioning and therapeutic relationship.	Clinical population (n = 96; 30 female) psychiatry services. Mage = 44 years Part 2 subgroup (21 inpatients; 33 community) UK	Prospective longitudinal	Social Behaviour Scale Working Alliance Inventory Inventory of Interpersonal Problems-32 Positive and Negative Syndrome Scale Psychosis Attachment Measure	Avoidant attachment associated with positive ( $p < .001$ ) negative symptoms ( $p = .019$ ) and paranoia ( $p < .001$ ). Association with paranoia independent of illness severity (anxiety $p = .506$ and avoidance $p = .992$ ). Changes in attachment anxiety correlated with changes in symptoms overtime ( $p = .027$ )

Study reference	Aims	Sample	Design	Key outcome measures	Key findings and significance values
Pickering, Simpson, & Bentall (2008)	To examine relations between attachment, paranoia and hallucinations, and possible mediators between attachment and psychotic symptoms	Non-clinical university student population (n = 503; 350 female) Age = 18-63 years (M = 20.9) UK	Cross-sectional, correlational	Launay-Slade Hallucination Scale-R Relationship Questionnaire Negative Events Scale Levenson Locus of Control Persecution and Deservedness Scale Self-Esteem Rating scale Beck Depression inventory	Attachment avoidance ( $p < .01$ ) and anxiety ( $p < .01$ ) correlated with paranoia. Insecure attachment predicted persecution paranoia ( $p < .001$ ) but not hallucinations, with co-morbidities controlled. Mediating factors included negative self-esteem, anticipation of threatening events and perception of others as powerful
MacBeth, Schwannauer, & Gumley (2008)	To explore associations between attachment styles psychotic symptoms and interpersonal behaviours, in a social mentality framework	Non-clinical university student population and 33 employed participants (n = 213; 166 female) Age = 17-33 years (M = 20.28) UK	Cross-sectional cohort	Relationship Styles Questionnaire Inventory of Interpersonal Problems Paranoia Scale Launay-Slade Hallucination Scale- R	Paranoia was correlated with avoidant ( $p < .01$ ) and anxious attachment ( $p < .01$ ). Attachment style and interpersonal distancing predicted paranoia. In contrast, constructs of dependence and avoidance (combined attachment and interpersonal difficulties) predicted hallucinations The PAM is a valid and reliable measure of attachment in non-clinical sample. Insecure attachment associated with paranoia (anxiety $p < .001$ ; avoidance $p = .006$ ). Attachment anxiety more strongly associated with paranoia ( $p < .01$ ) and hallucinations than attachment avoidance. Avoidance more strongly associated with social anhedonia
Berry, Wearden, Barrowclough, & Liversidge (2006)	To validate a measure of adult attachment styles and investigate associations between attachment and non-clinical psychosis symptoms	Non-clinical undergraduate and post-graduate student population (n = 323; 233 female) Age = 17-67 (Median = 21 years) UK	Cross-sectional, correlational	Psychosis Attachment Measure Relationship Questionnaire Parental Bonding Instrument Trauma History Questionnaire Paranoia Scale Launay-Slade Hallucinations Scale-R Social Anhedonia Scale PANAS	

### **1.3.3 Assessment of attachment.**

Across the studies there were seven different measures of attachment style utilised (see Table 2). The majority of studies administered the Relationship Questionnaire (RQ; nine studies; Bartholomew & Horowitz, 1991) and the Psychosis Attachment Measure (PAM; six studies; Berry, Wearden, Barrowclough, & Liversidge, 2006). The findings are comparable with a systematic review of attachment measures in psychosis (Gumley, Taylor, et al., 2014) which found seven different measures used across 21 articles, with the PAM used in nine of the studies, representing the most common measure.

However, in contrast the RQ was used in only two studies and instead the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1985) was preferred, administered in seven studies. Similarly, a review by Korver-Nieberg et al. (2014) found eight different measures of attachment, with the three measures previously indicated, the most commonly used.

The Relationship Questionnaire (RQ) is a single-item measure where participants are asked to choose which of four statements is most like them. The statements correspond to the four-category model of attachment and participants can then rate how much each style corresponds to them. This measure is widely used and easy to administer. It has acceptable test-retest reliability (Griffin & Bartholomew, 1994b) and has been validated against attachment interview measures such as the AAI (Crowell, Treboux, & Waters, 1999). However, reliability scores for the RQ have not commonly been reported in the literature and no studies using this measure, within the current review, have reported this result. It can be used as both a forced choice categorical measure, where participants read a narrative of different relationship styles and choose the closest fit to them, and a continuous measure using Likert rating scales for different relationship styles described. Nonetheless, evidence suggests multiple indicators of attachment, including multiple-item measures, should be used to ensure reliability, in order to counteract the difficulties in separating this from stability in single-item and categorical measures (Scharfe & Bartholomew, 1994).



Table 2

*Overview of Measures of Attachment used in the Studies within the Review*

Attachment Measure	Developer(s)	Type	Relationship Type	State/Trait Measure	Dimensions	Categories	Number of studies
Experiences in Close Relationships Scale-Revised	Fraley, Waller & Brennan (2000)	Self-report Multi-item (36-item)	Partner General	Trait	Anxiety Avoidance	-	1
Experiences in Close Relationships – Relationship Structure	Fraley, Heffernan, Vicary, & Brumbaugh (2011)	Self-report Multi-item (9-item)	Mother, father, partner, best friend	Trait	Anxiety Avoidance	-	1 (Portuguese version)
Relationship Questionnaire	Bartholomew & Horowitz (1991)	Self-report Categorical forced-choice (single-item)/Dimensional (4-item)	Partner	Trait	Anxiety Avoidance	Secure Preoccupied Dismissing Fearful	9 (1 Italian version)
Psychosis Attachment Measure	Berry, Wearden, Barrowclough, & Liversidge (2006)	Self-report Multi-item (16-item)	General	Trait	Anxiety Avoidance	-	6

Attachment Measure	Developer(s)	Type	Relationship Type	State/Trait Measure	Dimensions	Categories	Number of studies
Experience Sampling Method – Attachment Insecurity	Developed by Sitko et al. (2016) from the Adult Attachment Scale (Collins & Read, 1990)	Self-report Multi-item (6-items)	Partner	State	Insecure Secure	-	1
Adult Attachment Questionnaire	Hazan & Shaver (1987)	Self-report Single-item, forced choice	Partner	Trait	-	Secure Anxious Avoidant	1
Relationship Scales Questionnaire	Griffin & Bartholomew (1994)	Self-report Multi-item (30-item)	Partner or other specific relationship General	Trait	Model of self Model of others	Secure Preoccupied Dismissing Fearful	1

Interestingly, two studies within the current review employed two measures of attachment. Sitko et al. (2016) used the RQ alongside the experience sampling method (ESM insecurity) and Berry et al. (2006) used the PAM and the RQ.

However, in both cases the RQ, as a well-established measure, was used to validate the development of a new measure, i.e. the ESM and PAM respectively. Both measures demonstrated good concurrent validity in comparison with the RQ.

All administered measures in the current review were self-report, reflecting the dominance of the self-report tradition in the adult attachment literature, which is cost effective and easier to administer. Both the narrative and self-report assessment approaches derive from attachment theory and assume that early interpersonal experiences contribute to the development of working models. Whilst both approaches are considered valid and are regularly linked, there can be difficulties in interpreting results across different measurement styles (Mikulincer & Shaver, 2007). Therefore, whilst it could be argued the reliance on self-report measures within this review has its problems, such as the potential for bias in reporting, it allows for more robust comparisons across studies.

All questionnaires were trait measures with one exception, the experience sampling method used by Sitko et al. (2016), which is a real time measure of changes in attachment security. Attachment style is considered to be largely stable across the lifespan, as the working models created are believed to be self-perpetuating gathering information consistent with the representation formed. Nonetheless, there is some evidence that attachment style can be amended with new information resulting from key life events which are inconsistent with current working models (Crowell & Treboux, 1995). Findings from longitudinal studies reveal fluctuations in attachment. For instance, Baldwin and Fehr (1995) combined data from six studies which measured attachment at time points between 1 and 52 weeks, and found that 30% of individuals' attachment classification changed and the authors propose that this is not the result of measurement error, although further research is required to corroborate this. Therefore, this has implications for the reliability of trait measures.

The majority of the measures produced dimensional data, mostly differentiating between anxious and avoidant attachment. However, two of the measures were also able to produce categorical data such as; secure, preoccupied, dismissing, and avoidant. Although the Relationship Scales Questionnaire (RSQ; Griffin & Bartholomew, 1994) can be transformed into categories, it was originally designed as a dimensional measure and MacBeth, Schwannauer, and Gumley's (2008) study used it as such. There is evidence that the use of anxiety and avoidant dimensions in self-report measures is valid and that most measures of attachment can be organised within these dimensions (Brennan, Clark, & Shaver, 1998). In addition, after examining both categorical and dimensional approaches Stein et al. (2002) argued for adult attachment research to use the latter.

Overall, a range of attachment measures were utilised across studies included in the review, with all of them self-report measures, all but one a trait measure of attachment, and most using a dimensional approach to the measurement of attachment. Thus, there are methodological difficulties in comparing results across studies.

#### **1.3.4 Assessment of paranoia.**

In comparison to the attachment measures, there was larger variation in the measures of paranoia used across studies, with a total of 11 different measures employed (see Table 3), which may be representative of paranoia as a less well operationalised concept or indicative of less consensus on the measurement of paranoia. The range of measures used has implications for generalising across studies, although the majority are well-validated.

With the exception of three measures, all were self-report questionnaires, which are easier to administer and more cost-effective than semi-structured interviews. Two were in the form of semi-structured interviews, namely the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein, & Opler, 1987) and modules from the University of Michigan Composite Intervention (UM-CIDI; Wittchen & Kessler, 1994), which are well-established psychiatric tools for diagnosis and symptom assessment. Although the PANSS was the most common measure (used in six studies), only one item from this assesses paranoia directly.

Table 3

*Overview of Measures of Paranoia used in the Studies within the Review*

Measure	Developer(s)	Type	State/Trait	Subscales	Number of items related to paranoia	Population(s)	Number of Studies
Paranoia and Depression Scale (PDS)	Bodner and Mikulincer (1998)	Self-report questionnaire	State	2 Subscales (paranoia and depression)	7 items	Non-clinical	1
Paranoia Scale (PS)	Fenigstein and Venable (1992)	Self-report questionnaire	Trait	N/A	17 items	Non-clinical	3
Symptom Check List-90-R (SLC-90-R)	Derogatis (2000)	Self-report questionnaire	State	9 Subscales including 'Paranoid Ideation'	6 items	Non-clinical and Clinical	2
Community Assessment of Psychic Experiences (CAPE)	Stefanis et al. (2002)	Self-report questionnaire	Trait	3 Dimensions (positive, negative, depressive symptoms) 9 subscales including 'Paranoia' subscale	5 items	Non-clinical and Clinical	1
Schizotypal Symptoms Inventory Brief Version (SSI)	Hodgekins et al. (2012)	Self-report questionnaire	Trait	3 Subscales (social anxiety, paranoia, & anomalous experiences)	6 items	Non-clinical and Clinical	1

Measure	Developer(s)	Type	State/Trait	Subscales	Number of items related to paranoia	Population(s)	Number of Studies
Green Paranoid Thoughts Scale (GPTS)	Green et al. (2008)	Self-Report questionnaire	Trait	2 Subscales (ideas of social reference and ideas of social persecution)	32 items	Non-clinical and Clinical	3
Paranoia Checklist (PC)	Freeman et al. (2005)	Self-report questionnaire	Trait (State adapted; Lincoln et al., 2014)	3 Subscales (items rated for frequency, degree of conviction and distress)	18 items (repeated for each subscale)	Non-clinical (state-adapted: clinical non-clinical)	1
Positive and Negative Syndrome Scale (PANSS)	Kay et al., (1987)	Semi-structured interview	Trait (reference period of 1 week)	3 Subscales (positive symptoms, negative symptoms, general symptoms)	1 item (Suspiciousness/Persecution item from positive subscale)	Clinical	6
ESM Paranoia	Items taken from PaDs (Melo et al., 2009)	Self-report momentary sampling	State	N/A	2 items	Non-clinical and Clinical	1
Persecution and Deservedness Scale (PaDS)	Melo, Corcoran, Shryane, & Bentall (2009)	Self-report questionnaire	Trait	2 Subscales (persecution and deservedness)	10 items	Non-clinical and Clinical	2
University of Michigan Composite Interview (UM-CIDI)	Wittchen & Kessler (1994)	Structured Clinical Interview	Trait and State	23 modules, including 'Beliefs and Experiences' module which measures psychosis symptoms	3 items used in study selected	Non-clinical and Clinical	1

It could be argued that a single-item may not be sensitive enough to assess paranoia across the spectrum and may be an oversimplification of a complex concept. Taking this into consideration I believe it is crucial that future research is clear on the definition of paranoia and ensure that the measure chosen adequately assesses this. In addition, the use of multiple measures of paranoia may counteract some of the difficulties in measuring this concept and provide more robust data.

Furthermore, two of the studies which administered the PANSS suspiciousness/persecution item, also utilised a second valid measure of paranoia, increasing reliability of the findings (Fett et al., 2016; Wickham et al., 2015). In comparison, the Green Paranoid Thoughts Scale (GPTS; Green et al., 2008), a more comprehensive questionnaire with 32 items, was the second most common measure administered and was used in three of the 18 studies.

The majority of measures have been validated in both clinical and non-clinical populations (eight measures), consistent with the premise that experiences of paranoia fall along a continuum. In contrast, the Paranoia and Depression Scale (PDS; Bodner & Mikulincer, 1998) and the Paranoia Scale (PS; Fenigstein & Vanable, 1992) were designed for non-clinical populations and the PANSS is for use in clinical populations only. The measures were administered in the appropriate populations across all studies within the review.

In total, six of the measures can be classified as trait measures, which assesses relatively stable personality characteristics over time; three can be described as state measures, recording momentary changes in paranoia; and two had versions available to assess both state and trait paranoia. It is worth noting that most of the studies in the review used cross-sectional designs and therefore, trait measures were more appropriate to reduce the potential effects of confounding variables.

In contrast, Sitko et al. (2016) used a distinct method of measuring paranoia in the form of experience sampling. Participants rated two items derived from the Persecution and

Deservedness Scale (PaDS, Melo, Corcoran, Shryane, & Bentall, 2009) at 10 time points each day over a six-day period, allowing for the recording of real-time changes in paranoia over an extended period. The PANSS was also incorporated within the study to assess clinical and control group differences, but unfortunately no data was reported comparing the ESM measure and the PANSS.

Despite there being much variation in the measures of paranoia used, most were trait, self-report measures which were validated in populations across the paranoia continuum and were used appropriately. However, the PANSS was the most common measure used, which relies upon only one question pertaining to paranoia and therefore results from these studies should be interpreted with caution.

### **1.3.5 Evidence of association between attachment style and paranoia.**

A key finding is that all studies within the review found some evidence of an association between experiences of paranoia and adult attachment style. All 18 studies report at least one significant association between attachment style and paranoia (see Table 4). Importantly, all of these related to positive correlations, with increased attachment insecurity associated with an increase in paranoia symptoms. Six studies (33%) found associations in non-clinical populations, eight (44%) found associations in clinical populations and four (22%) found associations in both populations. However, several studies failed to correct for multiple comparisons in their analyses and thus there could be an overreporting of findings. It is also possible that this finding is the result of a publication bias towards positive findings.

Opposing this, 11 papers did not find an association between specific attachment styles and paranoia symptoms and of these, 36% were in non-clinical samples and 64% were in a clinical sample. Thus, a similar proportion of studies finding an association and no association were from a clinical population.



Table 4

*Studies Evidencing an Association or No Association Between Attachment Style and Paranoia*

Attach type	Association with paranoia				No association with paranoia			
Secure	<a href="#">Ciocca et al. (2017)</a> – negative association				Strand et al. (2014) <a href="#">Sitko et al. (2014)</a> Ponizovsky et al. (2013)			
Insecure	Sitko et al. (2016)							
	Anxious	Preoccupied	<a href="#">Hutton et al. (2017)</a> <a href="#">Russo et al. (2017)</a> <a href="#">Darrell-Berry et al. (2017)</a> Castilho et al. (2017) - with mother only Fett et al. (2016) – GPTS <a href="#">Wickham et al. (2015)</a> Korver-Nieberg et al. (2015) <a href="#">Sitko et al. (2014)</a> <a href="#">Korver-Nieberg et al. (2013)</a> <a href="#">Pickering et al. (2008)</a> <a href="#">MacBeth et al. (2008)</a> <a href="#">Berry et al. (2006)</a>		Anxious	Fett et al. (2016) – PANSS Berry et al. (2008)	Preoccupied	Pearce et al. (2017)
								Strand et al. (2014) Ponizovsky et al. (2013)
	Avoidant	Dismissive	<a href="#">Ciocca et al. (2017)</a> Pearce et al. (2017) Korver-Nieberg et al. (2015)		Avoidant	Russo et al. (2017) - high risk sample Castilho et al. (2017) <a href="#">Wickham et al (2015)</a> <a href="#">Korver-Nieberg e.t al. (2013)</a> -healthy controls	Dismissive	<a href="#">Ciocca et al. (2017)</a> Pearce et al. (2017) Strand et al. (2014) Ponizovsky et al. (2013)
	Anxious	Fearful/ disorganised	<a href="#">Ciocca et al. (2017)</a> Strand et al. (2014) Korver-Nieberg et al. (2015) Ponizovsky et al. (2013)		Anxious	Fett et al. (2016) – PANSS Berry et al. (2008)	Preoccupied	Pearce et al. (2017)
								Strand et al. (2014) Ponizovsky et al. (2013)

Note. Purple = both clinical and non-clinical sample; Blue = non-clinical sample; Black = clinical sample

The studies used a range of attachment measures across both categorical and dimensional traditions, meaning inferences across results are more challenging. However, associations can be readily explored within specific attachment styles, as depicted in Table 4. A total of 12 different studies found support for an association between anxious attachment and paranoia symptoms. In contrast no association was found in two papers with this attachment style. In particular, Fett et al. (2016), found both an association and no association when using two different measures of paranoia. It may be that the GPTS was a more sensitive measure of paranoia when compared to the PANSS. Furthermore, the authors argued that the PANSS measure itself is more closely related to attachment avoidance.

Similarly, 12 studies reported an association between avoidant attachment style and paranoia symptoms. Contrary to these findings four studies reported no association. One study found evidence for both an association and no association using the PAM measure of attachment in different populations (Russo et al., 2017). An association was found in healthy volunteers, but not in individuals at high-risk of psychosis, although the latter result was approaching significance. The authors suggested that the method of categorising attachments from the PAM may not be accurate, and the results potentially skewed as more participants in the healthy group were characterised as avoidant attachment and more individuals in the high-risk group were anxiously attached. In another study, avoidant attachment was found to be correlated with paranoia in the clinical group but not in the control group (Korver-Nieberg et al., 2013).

Six studies used the three-category model of attachment, grouping individuals into preoccupied, fearful and dismissing attachment types, and the results are less clear. In particular, three studies found evidence for an association between paranoia and fearful attachment style and two studies found no association. Only one study found support for an association across all three attachment styles (Korver-Nieberg et al., 2015). Two of the six studies found evidence for an association between paranoia and preoccupied attachment only (Ponizovsky et al., 2013; Strand, Goulding, & Tidefors, 2014) and Ciocca et al. (2017)

found support for an association with preoccupied and fearful attachment. Examined together, most support was found for a link between preoccupied attachment style and paranoia symptoms and least support for an association with dismissing attachment.

When examining the number of associations, it appears that there is strong evidence for a positive association between insecure attachment and experiences of paranoia, with greater attachment insecurity related to an increase in paranoia.

The majority of studies used a cross-sectional design limiting inferences about causation. However, the two studies which utilised an experimental design reported similar findings of associations between paranoia and both avoidant and anxious attachment styles (Fett et al., 2016; Hutton et al., 2017), with the former reporting one discrepancy due to the use of two different measures of paranoia as previously described. Hutton et al. (2017) was the first to find empirical evidence for this association through the comparison of secure attachment priming with neutral and positive affect priming control groups. Following priming all groups received paranoia induction and state and trait paranoia measures were administered. Post-priming, attachment anxiety was the only predictor of state paranoia and there was an interaction between attachment anxiety and group. The secure prime was not found to reduce paranoid thinking, as hypothesised, instead it resulted in higher paranoia for individuals with increased attachment anxiety. The experimental design used in this study highlights the potential differential impact of specific attachment styles on paranoia symptoms, which has implications for our understanding of the link between attachment and paranoia, as well as, clinical and ethical implications. For instance, if this finding is replicated, it would be important to measure attachment styles for individuals prior to implementing any secure paranoia prime, to ensure that those with attachment anxiety do not receive the prime, which could have potentially adverse effects for them. However, further experimental research is required to explore this.

Additionally, two studies used a prospective design extending these findings further. One found a positive association between paranoia and avoidant attachment only,

independent of illness severity (Berry et al., 2008). However, the longitudinal data revealed that changes in attachment anxiety over time were positively associated with changes in overall symptoms measured by the PANSS but were not significantly associated with the single paranoia item.

Contrary to this, Sitko et al. (2016) used momentary sampling to explore changes in paranoia and attachment over a six day period, and found that increases in attachment insecurity predicted increases in paranoia, even when controlling for auditory hallucinations and self-esteem. Thus, this study provides some evidence for the directionality of this relationship. In addition, the clinical group demonstrated higher levels of attachment insecurity and greater variations in attachment over time, indicating that insecure attachments may be less stable than secure attachment.

Notably, the majority of papers within the present review did not examine separate components of paranoia, such as social reference and persecution paranoia, as measured by the GPTS (Green et al., 2008), with one main exception. One study found that social reference paranoia was associated with attachment anxiety, and attachment avoidance was associated with persecution paranoia in clinical participants (Korver-Nieberg et al., 2013). However, this paper had low power due to a small sample size.

A third of the studies used a control group, representing a more robust design, and all of these found some association between insecure attachment style and paranoia symptoms. However, four also found no evidence of an association. Nonetheless, there is little difference in quality ratings recorded across the studies and no difference in the average rating between papers reporting an association ( $M^2 = 86$ ) and those reporting no association ( $M = 86$ ), indicating that differences in research quality does not explain all differences reported.

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<sup>2</sup> M = Mean

Interestingly, the majority of studies do not directly report comparisons of secure attachment with paranoia. There is an implicit focus on deficits in internal working models of attachment instead of on strengths or protective factors, which has implications for treatment directions. Future research could focus on measuring secure attachment as a potential protective factor for developing paranoia.

Overall, pooled findings appear to demonstrate strong evidence for a positive association between insecure attachment styles and paranoia, although there are mixed findings for the link with specific styles. Similarly, the direction of this relationship remains unclear due to the cross-sectional design of most studies. However, two studies using an experimental design revealed initial evidence that changes in attachment predict changes in paranoia, a finding that would need to be replicated in larger robust studies.

### **1.3.6 Differences between clinical and healthy participants.**

Five studies reported key differences in attachment between clinical and healthy participants. One study reported generally increased levels of mean attachment insecurity in clinical participants (Sitko et al., 2016) and three described higher levels of attachment anxiety in the clinical groups (Fett et al., 2016; Korver-Nieberg et al., 2013; Russo et al., 2017). In comparison, one study found increased rates of avoidant attachment in healthy volunteers (Russo et al., 2017). Extending this, Sitko et al. (2016) found that clinical participants experienced greater fluctuations in insecure attachment overtime compared to non-clinical participants, indicative of less stable internal working models within this group. However, in a comparison between stable and unstable patients with psychosis, no significant difference in attachment stability was revealed (Berry et al., 2008), although the measure used (PAM) is a trait measure of attachment.

### **1.3.7 Mediating factors in the relationship between attachment and paranoia.**

Examination of the results suggest a complex relationship between attachment and paranoia exists. Four papers describe potential mediating factors that highlight mechanisms

by which attachment style and experiences of paranoia are associated. Specifically, in a cross-sectional study experiential avoidance, defined as reluctance to experience difficult internal events, was found to be a mediating factor between attachment anxiety and paranoia (Castilho et al., 2017). Similarly, interpersonal distancing was found to mediate between insecure attachment and paranoia utilising a cross-sectional cohort design (MacBeth et al., 2008). These can be described as deactivating secondary attachment strategies, with the goal to reduce the pain caused by inability to seek proximity to their caregiver (Shaver & Mikulincer, 2002).

Furthermore, negative self-esteem mediated the relationship between both anxious and avoidant attachment style, and paranoia (Pickering, Simpson, & Bentall, 2008; Wickham et al., 2015). Other cognitive factors implicated in the relationship include; anticipation of threatening events and perception of others as powerful (Pickering et al., 2008).

### **1.3.8 Attachment and paranoia as mediating factors.**

The relationship is complicated further as two studies also found attachment style was itself a mediating factor between early adverse life events and paranoia symptoms. Pearce et al. (2017) suggest fearful attachment mediates the relationship between trauma and paranoid ideation. Furthermore, both anxious and avoidant attachment were found to fully mediate the association between early experiences of neglect and paranoia, and avoidant attachment partially mediated experiences of being held captive and paranoia (Sitko et al., 2014).

Darrell-Berry et al. (2017) employed a cross-sectional design to provide some evidence that paranoia may also be a mediating factor, implicated in the relationship between avoidant attachment and anger experiences, although this study had low power.

### **1.3.9 Differences between paranoia and hallucinations.**

A key theme emerging from the studies relates to distinctions between two of the most common psychosis symptoms, paranoia and hallucinations, in particular, specificity in

the psychological mechanisms implicated in the development and maintenance of these symptoms. Six of the 18 studies reported key direct and indirect differences in attachment styles between people presenting with the two symptoms. Insecure attachment style was predictive of paranoid ideation but not hallucinations, with co-morbid symptoms controlled for (Pickering et al., 2008; Wickham et al., 2015). Utilising a cross-sectional design in an adult clinical population in Israel, Ponizovsky et al. (2013) found preoccupied attachment<sup>3</sup> was related to increased paranoia and conversely hallucinations were associated with fearful attachment. The authors propose that hyperactivating strategies linked to preoccupied attachment contribute to the development and maintenance of paranoia, whilst deactivating strategies linked to fearful attachment, influence hallucinations. In addition, one cross-sectional study in a clinical population within the UK, described fearful attachment as a significant mediator between trauma and paranoia, but not between trauma and voice hearing (Pearce et al., 2017). Similarly, early trauma experiences were differentially associated with hallucinations and paranoia, whereby sexual abuse was specifically linked with hallucinations and neglect linked to paranoia. Furthermore, attachment insecurity was not implicated as a mediating factor between hallucinations and sexual abuse but was implicated in the relationship between neglect and paranoia. Instead dissociation was found to be a mediator between trauma and hearing voices.

One study contradicted these results, reporting that both paranoia and hallucinations were associated with avoidant and anxious attachment (Korver-Nieberg et al., 2015). However, importantly this study did not control for the high comorbidity between these symptoms. Several studies which did carefully consider controlling for confounding factors found these significantly influenced the findings. In two studies, increased attachment insecurity predicted paranoia and hallucinations prior to controlling for comorbidities, but

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<sup>3</sup> Preoccupied attachment defined by Bartholomew and Horowitz's (1991) four-category model of attachment as an individual with a negative model of self and positive model of others leading to them desiring relationships but being anxious about them.

only the association with paranoia remained significant subsequent to the addition of comorbid symptoms (MacBeth et al., 2008; Sitko et al., 2016).

## **1.4 Discussion**

The current review provides some evidence for an association between adult attachment style and paranoia symptoms. Specifically, insecure attachment is found to be associated with increased symptoms of paranoia. However, the relationship between different attachment styles and paranoia is less clear. This could in part be due to the variation in measures of attachment utilised and the differences in the underlying approaches of categorical or dimensional measures. These different approaches result in measurement of different attachment style constructs, although there is possibly some overlap across some measures.

The findings also highlight the limits of Ein-Dor et al.'s (2016) untested transdiagnostic attachment model, which suggests a specific link between anxious attachment style and paranoia, but does not account for a link with avoidant attachment.

In addition, whilst there is evidence for an association between adult attachment style and paranoia, there is less evidence for the directionality of this relationship. Nonetheless, there is some emerging experimental data to indicate that attachment style precedes onset of paranoia symptoms, largely consistent with attachment theory (Bowlby, 1988a), which suggests that an individual's attachment style develops from early infant-caregiver relationships and shapes later development. However, Bowlby (1988) also noted the ongoing plasticity of the attachment system throughout the life cycle, implying that changes to attachment style are possible at any stage. Therefore, the potential for a more complex reciprocal relationship between attachment and paranoia remains and further robust research is required to clarify the nature of the relationship. To examine this, future research would benefit from utilising a longitudinal design and measuring both paranoia and attachment and various time points. Alternatively, future research could use momentary



sampling methodology as described by Sitko et al., (2016), over longer time periods and include manipulations of paranoia and priming of attachment at various time points to observe the effects.

Paranoia is widely understood to lie along a continuum from normal experience to clinical difficulties (Van Os et al., 2000); however, the current review has found that there may be some key differences between clinical and non-clinical populations. The predominant attachment style in each group appears to vary and there is some evidence of less stability in attachment style within clinical groups. The evidence suggests that healthy populations are associated with greater levels of avoidant attachment and clinical populations are associated with higher attachment anxiety. In relation to how this may impact experiences of paranoia, it is hypothesised that the secondary attachment strategies accompanying an avoidant attachment style, namely deactivating strategies such as withdrawal from intimacy and distancing in relationships, are less pronounced in non-clinical populations and therefore are less influential on paranoia in this group. In comparison an anxious attachment style is associated with hyperactivating secondary strategies, including hypervigilance to threat, which can increase vulnerability to paranoid thoughts (Ein-Dor, Mikulincer, Doron, & Shaver, 2010). However, contrary to findings from previous reviews, the current review found evidence that both insecure attachment styles are associated with symptoms of paranoia across the spectrum and therefore further research is required to test these hypotheses in more detail. Moreover, it is suggested that clinical populations have less coherent and more uncertain internal working models, which leads to greater fluctuations in attachment insecurity (Joanne Davila, Burge, & Hammen, 1997). These findings indicate possible risk factors for the development and maintenance of clinical paranoia, which could be targeted in therapeutic interventions.

Interestingly there was strong support for the specificity of the relationship between attachment and paranoia, with hallucinations not linked to attachment style and instead likely to be associated with different developmental pathways. For instance, dissociative

experiences have been found to mediate between trauma and the development of hallucinations, a finding that was not replicated with delusions (Perona-Garcelan et al., 2012). Similarly, Bentall, Wickham, Shevlin, and Varese (2012) found that when controlling for co-morbidity of symptoms, hallucinations were only associated with childhood rape and paranoia was associated with institutional care. The authors suggest this is evidence for the role of attachment difficulties in paranoia and for dissociative mechanisms in hallucination formation. It is also speculated that these symptoms are often co-morbid, as types of early adversity are likely to co-occur and the impact of these experiences can have indiscriminate psychological effects. Importantly, such findings are consistent with the current cognitive model of hallucinations, which does not implicate a role of attachment style (Beck & Rector, 2003).

The concept of different pathways relating to specific symptoms corroborates the relatively recent shift in how psychosis is conceptualised, with a focus on individual symptoms instead of broad diagnoses. This has important implications for cognitive models of psychosis, which tend to integrate the positive symptoms experienced (Garety et al., 2001; Morrison, 2001). Therefore, specific symptom models may be more useful in developing our understanding of the psychological mechanisms involved. The finding that attachment insecurity is specifically linked to paranoia may indicate that models of persecutory delusions (Freeman & Garety, 2004) require updating to include the role of attachment in the development and maintenance of paranoia. Alternatively, attachment theory may provide an independent framework from which to conceptualise paranoia symptoms. The use of such models could lead to more targeted interventions for specific symptoms.

Furthermore, this review has found that the relationship between paranoia and attachment is unlikely to be a simple direct association, with several cognitive and behavioural mechanisms potential mediators of this relationship. Factors such as self-esteem and experiential avoidance have been found to be full or partial mediators. However, the

majority of studies were cross-sectional and therefore unable to explain causality. Therefore, further research is required to understand the multitude of contributing factors and to establish direction of causality within them. In addition, attachment and paranoia may also be mediating mechanisms implicating related factors such as early adverse experiences.

Overall, the current review suggests a complex relationship, with early trauma experiences differentially associated with attachment style, which mediates the relationship with paranoia symptoms. Several mechanisms are also implicated in the association between attachment style and paranoia. Finally, paranoia may mediate the relationship between attachment style and later experiences of anger. However, there is currently no model which synthesises these findings and further research is required to map out the complex interaction between all contributory factors. An attachment-based model of psychosocial factors implicated in the development in psychosis has been proposed (Harder, 2014), although this was focused on disorganized and avoidant attachment classifications only and did not distinguish between specific symptoms of psychosis. The present findings suggest areas for extending this model further.

According to Bentall et al. (2001), an explanatory theory of persecutory delusions requires five key elements, most of which have been highlighted within the present review. These factors include; clearly defined constructs and psychological processes which can be reliably measured, robust evidence to support hypothesised relationships, data gathered from a range of sources beyond questionnaire and self-report evidence, and a clear explanation for change in symptoms over time. Information collated within this review indicates that there is still a long way to go to reach this goal; however, there are moves in the right direction, and attachment theory may support this progress.

### **1.4.1 Implications**

The implication of multiple possible mechanisms and pathways suggests a range of possible treatment targets. Assessment or screening of attachment style may be particularly

relevant for clinicians supporting individuals with psychosis, who could feasibly adapt the therapeutic approach accordingly in order to enhance the therapeutic relationship, found to be a key predictor of outcome in the treatment of psychosis (Neale & Rosenheck, 1995).

The findings may contribute to the development of interventions targeting specific attachment processes. For instance, secondary attachment strategies, such as experiential avoidance observed in individuals with avoidant attachment, could be incorporated into psychological formulation to inform the therapeutic relationship and interventions to challenge these potentially unhelpful behaviours. Additionally, the suggestion that attachment style may fluctuate over time reveals that attachments may not be as stable as initially believed. A review by McConnell and Moss (2011) indicates several factors across the lifespan that influence changes in attachment security, with negative life events such as parental bereavement, the strongest predictor of change in attachments overtime. It is possible that both state and trait models of attachment can be held by an individual in parallel (Pierce & Lydon, 2001) and thus there is potential to produce interventions to target this, such as the priming of a secure attachment described by Hutton et al. (2017). Similarly, identifying attachment style as a potential risk factor for developing clinical paranoia, may contribute to the development of preventative interventions, which target insecure attachment and the subsequent secondary attachment behaviours.

The range of measures for both attachment and paranoia create significant challenges for clinicians and researchers. Information from the current review suggests that there needs to be a consensus within the literature on the constructs of attachment and clear measurement of paranoia across the continuum.

#### **1.4.2 Critical review of the literature.**

Key methodological limitations can be identified across studies. The majority of studies utilised a cross-sectional design, consistent with findings from previous reviews (Berry et al., 2007). It is likely that this was the dominant research design as it is relatively

easy and cost-effective to conduct. However, the noticeable lack of longitudinal and experimental data means that causality cannot be confidently established. Cross-sectional designs may also miss confounding variables which may be especially relevant when considering that the relationship between attachment and paranoia is likely to be complex and involve multiple factors. Finally, cross-sectional studies do not take into consideration fluctuations in attachment style, for example, as a result of contextual factors. Consideration should be given to alternative methods, such as the use of single-case series designs, which allow for more detailed monitoring of changes over time.

Additionally, most studies used self-report questionnaires to measure both attachment and paranoia, which may be subject to reporting error. For instance self-report measures are influenced by biases such as the social desirability bias which should be assessed and controlled for (van de Mortel, 2008). Although, self-report measures are often convenient to administer and analyse, the reliance on one approach to measurement increases the potential for bias. Nonetheless, all the included measures reported good psychometric properties and a review by Shaver and Mikulincer (2004) concluded that self-report measures of attachment are fairly accurate. Therefore, although self-report measures can be useful administered in research and clinical practice, it would also be sensible to include an alternative measure of attachment or a measure of social desirability bias.

The range of measures used for assessing attachment and paranoia also limits the generalisability of the results. Different measures may assess for slightly different concepts making direct comparisons more difficult. This is especially important when considering measures of attachment style, which are broadly developed from two different theoretical stances and categorise attachment styles differently, making it challenging to establish the relationship between the differing attachment styles and paranoia. Future research would benefit from agreement on well-defined concepts of attachment and paranoia.

The majority of measures of attachment style assessed adult attachment and did not consider developmental attachment experiences. Whilst attachment style is largely stable, it

can change across a lifetime (McConnell & Moss, 2011) and therefore caution is required when drawing conclusions from associations between early trauma experiences and measures of later attachment style. In contrast, previous reviews have criticised the dominance of the Adult Attachment Interview, which they argued focuses on childhood relationships with caregivers and therefore does not accurately represent adult attachment style (Berry et al., 2007). The present review reveals the importance of considering measurement of both state and trait attachment styles to account for potential changes over time.

Rating the quality of the studies revealed that many did not carefully consider controlling for confounding variables. In particular, hallucinations and paranoia have been found to be highly correlated (e.g. Pickering et al., 2008) and when not considered as co-variables reveal differing results (e.g. MacBeth et al., 2008). Thus, future studies would benefit from including relevant confounding variables in the design and statistical analysis of data, and where possible it would be prudent to consider re-analysing the data from the studies that did not consider this factor. Similarly, the quality assessment identified that several studies failed to correct for multiple comparisons within their statistical analysis, and therefore fail to control for type one errors. As a result, the data from these studies may be more likely to falsely report a significant association between paranoia and attachment styles, skewing the overall data. We can therefore, be less confident in our conclusions of a significant association between these factors, although other studies which did employ robust statistical procedures did support these findings.

It is also worth noting that the research included in this review is predominantly focused on the maladaptive outcomes of attachment insecurity. Less attention is given to the potential protective function of attachment security, with one key exception (Hutton et al., 2017). However, this does reflect a bias within the wider literature relating to attachment theory. Similarly, there is limited research exploring the potential adaptive functions of insecure attachment styles, such as those proposed by social defence theory, whereby

attachment patterns may have detrimental effects for individuals, but can also have an evolutionary advantage for groups (Ein-Dor et al., 2010). Broadening the scope of the research to harness the adaptive functions of different attachment styles may be particularly helpful in developing useful therapeutic interventions.

### **1.4.3 Limitations of the current review.**

The current review should be considered within the context of its limitations. The review was focused on papers which specifically discussed the relationship between attachment and paranoia, meaning that potentially relevant papers examining wider questions were excluded. Likewise, not all published papers and articles in other languages were accessible to the researchers, resulting in missing data and a potential skew in the review's results. The exclusion of unpublished literature also limits the pool of data available. Therefore, the review is also likely to be influenced by a publication bias, which refers to the tendency for publications to publish positive/significant findings. Additionally, participants from the studies originated from a limited number of developed countries.

There are a range of quality assessment measures available which all come with their limitations. Whilst the QualSyst assesses a range of areas and is user friendly, it also misses some potentially important methodological questions. For instance, the measure does not consider whether there are adequate links to theory to justify a study's hypotheses and conclusions, there is no rating for the novelty/scientific value of the study, and there are no questions exploring context descriptions. The QualSyst does rate the outcome measures, but this appears to relate mainly to whether the measure is well-defined and doesn't consider its psychometric properties. Finally, it is described as a preliminary measure, with unknown inter-rater reliability and the summary scores generated for each study could introduce potential bias. Nonetheless, the QualSyst is a useful tool for a broad overview of the quality of the studies using a range of designs and did provide a framework for observing common methodological limitations across studies.

The use of a narrative approach to synthesise the data also has some notable limitations. It relies upon a ‘vote counting’ method which doesn’t take into consideration other factors such as the size and quality of the study, although this is mitigated in some way through the inclusion of a quality rating system. Additionally, due to limited available data and resources to gather relevant information, the current review doesn’t consider effect sizes and instead reports statistical significance results in isolation.

#### **1.4.4 Conclusion**

The current review found evidence for an association between insecure adult attachment style and symptoms of paranoia across clinical and non-clinical populations, although causation remains unclear. The findings highlight many potential complex factors involved in this relationship, which is unlikely to be a simple interaction. Further research would benefit from the use of a range of self-report and interview measures, appropriate control of other confounding variables, longitudinal design, and a consensus on concept definitions and measurement.

Overall, the findings from the review implicate a role for attachment theory in developing appropriate interventions for paranoia across the paranoia spectrum, i.e. from non-clinical to clinical symptoms. It is clear that attachment style is associated with paranoia, with early indications that changes in attachment impact on levels of paranoia. Furthermore, there is initial evidence to show that attachment styles may fluctuate, thus implicating attachment as a potential target for interventions. Chapter two describes two empirical studies that explore the impact of priming a secure attachment, firstly in a non-clinical population, and secondly in a clinical population, on levels of paranoia. The studies were careful to draw on some of the key findings from the review, for example, in carefully considering appropriate measures of attachment and paranoia for both populations.



## **Chapter 2: Empirical Paper. The Impact of an Attachment-Based Imagery Intervention on Paranoia**

### **2.1 Overview**

There is growing support for the use of secure attachment priming interventions trans-diagnostically and in paranoia specifically (Bullock, Newman-Taylor, & Stopa, 2016). Although, the use of these interventions has yet to be formally tested with individuals experiencing clinical levels of paranoia.

Despite recent interest in the delivery of online interventions, analogue studies investigating the use of interventions in paranoia have focused predominantly on direct, one-to-one interventions (e.g. Bullock, Newman-Taylor, & Stopa, 2016). Prior to formally testing the intervention in a clinical sample, it is important to consider whether arguably more flexible and less intrusive methods of delivery (such as an online intervention) may be effective.

This chapter therefore overviews two studies. The first is a pilot study, testing the feasibility and impact of an online imagery intervention for paranoia, including a seven-day follow-up, in an analogue population. The second describes two clinical case studies, assessing the impact of an attachment-based imagery intervention for two individuals experiencing clinical levels of paranoia.

### **2.2 Introduction**

Attachment theory, first proposed by Bowlby (1973), is a psycho-biological theory which suggests that humans are predisposed to form attachment bonds with key caregivers. This innate system has the primary goal of protection from physical and psychological threats (felt security), which allows safe exploration of the environment and interaction with others. Activation of the attachment system in times of threat triggers attachment behaviours

which serve to maintain proximity to our caregivers and support us in managing our distress. Thus, it acts as a homeostatic system for security and emotion regulation.

The theory suggests that repeated interactions generate mental representations of the self and others, known as internal working models (Bowlby, 1973). Working models are seen as cognitive-affective systems, which include memories, beliefs about self, others and relationships (Dykas & Cassidy, 2011). Importantly, mental representations are linked through excitatory and inhibitory mechanisms, meaning that activation of one working model primes consistent models and inhibits inconsistent ones (Dykas & Cassidy, 2011). The active working model provokes cognitive predictions, affective responses, and behaviour congruent with itself (Dykas & Cassidy, 2011), and thus the associations are strengthened over time.

If our early caregivers are available and responsive to distress, then a secure attachment style develops, which builds positive mental representations of self and others. In contrast, if a caregiver is unreliable or not available, then we fail to achieve felt security and develop negative representations, an anxious-attachment style. This style leads to secondary behaviours in order to manage distress in the form of activating strategies, such as increasing distress in order to regain proximity with an attachment figure. Similarly, interactions with caregivers who punish or reject intimacy, will lead to the formation of an avoidant-attachment style, associated with deactivating behaviour strategies, such as avoiding close relationships (Shaver & Mikulincer, 2002).

Insecure attachment styles are common across a range of psychopathology (Mikulincer & Shaver, 2007a). Attachment insecurity has been associated with major depression, obsessive compulsive disorder and generalized anxiety disorders (Dadashzadeh, Musazadeh, Ebadi Yusefi, & Amiri, 2018); post-traumatic stress disorder (Mikulincer, Ein-Dor, Solomon, & Shaver, 2011); eating disorders (Tasca & Balfour, 2014); and personality disorders (Westen, Nakash, Thomas, & Bradley, 2006). Thus, it has been suggested that attachment insecurity forms a general vulnerability to developing psychopathology (Davila,

Ramsay, Stroud, & Steinberg, 2005). Although attachment styles are believed to be relatively stable over the lifespan, they can also change in either direction with experience (Waters, Merrick, Treboux, Crowell, & Albersheim, 2000).

Attachment insecurity has also been linked with the development and maintenance of psychosis. A study in a sample of 79 patients with psychosis, found approximately 68% were categorised as having an insecure attachment style using the Adult Attachment Interview (Gumley, Schwannauer, et al., 2014). Several recent reviews have supported this association (Berry et al., 2007; Gumley, Taylor, et al., 2014; Korver-Nieberg et al., 2014), although these are limited by studies using cross-sectional methodology and thus the direction of the relationships found are unknown.

More recently, there is growing evidence for a link between attachment and specific symptoms of psychosis (Korver-Nieberg et al., 2015), in line with a trend to move away from diagnostic categorisation in psychosis to a symptom-specific understanding of experiences (Kinderman & Cooke, 2000).

A key positive symptom in psychosis is paranoia, which refers to a belief that others will intentionally cause you harm (Freeman & Garety, 2000) and occurs along a spectrum from non-clinical to clinical populations (Elahi et al., 2017). Paranoid beliefs are understood to be organised in a hierarchy from common social concerns to severe concerns (Freeman et al., 2005), and are therefore inherently interpersonal. Insecure attachment styles have been linked with paranoia symptoms, in non-clinical populations (e.g. Ciocca et al., 2017; Darrell-Berry et al., 2017); at-risk populations (Russo et al., 2017); and clinical populations (e.g. Korver-Nieberg et al., 2015; Pearce et al., 2017; Ponizovsky et al., 2013; Wickham et al., 2015). However, the exact nature of this relationship remains unclear due to a lack of longitudinal and experimental studies.

If insecure attachments are associated with increased risk for psychopathology, then secure attachment may be protective against psychopathology. In fact, attachment security is

believed to be a key element to resilience (Rutten et al., 2013). In a systematic review of 21 studies examining attachment in individuals experiencing psychosis, attachment security was linked to fewer symptoms and interpersonal difficulties, and better engagement with mental health services (Gumley, Taylor, et al., 2014). Thus, attachment security could be a useful framework for supporting recovery.

A thematic review of 58 texts identified a key goal for attachment-informed psychotherapy was to support patients to move from insecure to more secure internal working models (Berry & Danquah, 2016). Mikulincer and Shaver (2012) argue there is strong research evidence for the value of interventions designed to increase attachment security, which can have positive effects on mental health, behaviour, and social relationships (Mikulincer & Shaver, 2007b). One approach emerging in the research is the use of priming interventions. In a series of studies, it was found that subliminal priming of secure attachment representations, increased positive evaluations of neutral stimuli (Mikulincer, Hirschberger, Nachmias, & Gillath, 2001) and increased felt security and willingness to explore compared to anxious, avoidant and neutral primes (Luke, Sedikides, and Carnelley, 2012). Carnelley, Otway, and Rowe (2015) examined the impact of attachment priming in an undergraduate population and found repeated secure-attachment priming resulted in lower anxiety.

One way to prime a secure attachment may be through imagery tasks, which arguably offer more direct access to emotion regulation systems than their verbal counterparts, and have been utilised in a range of disorders (Holmes & Mathews, 2010; Holmes, Mathews, Mackintosh, & Dalgleish, 2008).

There is increasing evidence that imagery plays an important role in psychosis, with 74.3% reporting intrusive imagery related to their symptoms (Morrison et al., 2002). There is some evidence for the effectiveness of CBT and Compassion-Focussed Therapy (CFT) imagery with individuals experiencing paranoia (Lincoln, Hohenhaus, & Hartmann, 2013; Morrison, 2004). In contrast, Ascone, Sundag, Schlier, and Lincoln (2016) found no effects

of a single-session CFT imagery on paranoia in a clinical population. The authors suggested that longer interventions may be required and indicated a potential moderating role of attachment style.

An experimental study in 30 healthy participants with high sub-clinical paranoia found that positive self-imagery was associated with less paranoia, anxiety and negative affect, and more positive affect and self-compassion compared to negative self-imagery (Bullock et al., 2016). There were significant limitations of this study, which used a small, mainly female sample, no manipulation check, a lack of neutral-imagery control, and no follow-up. Thus, the effects are not generalisable to the wider population and it is unclear if they are sustained beyond a single-session. The imagery conditions involved recalling an interpersonal memory of a time they felt secure and trusting (positive imagery) or suspicious and mistrusting (negative imagery). Thus, the interventions can be conceptualised as attachment primes and suggest that secure attachment imagery may impact symptoms of paranoia.

In contrast, Hutton et al., (2017) explored the potential buffering effects of secure-attachment priming on state paranoia in 60 students. Individuals were allocated to secure, positive or neutral imagery primes, followed by a paranoia induction task. Paranoia did not differ across priming conditions. However, the secure prime was found to have a potential detrimental effect in individuals with an anxious attachment style. It was suggested that the secure prime may have triggered negative experiences in this group, and highlights the importance of robust research protocols to manage potential distress. Nonetheless, the authors indicated there is not yet enough evidence to discard the idea of secure attachment priming in paranoia, especially considering the studies' limitations. It is possible that the paranoia induction was not effective and the study used a student sample limiting its generalisability. Also, unlike previous research they did not use a high-paranoia sample, which may have contributed to a lack of significant findings.

Extending this research, it may be valuable to determine whether it is possible to deliver such interventions online. Advances in technology over several decades have led to an increasing focus on the use of digital tools for promoting mental well-being and providing accessible interventions to a wider audience, and this is recognised in the NHS Five Year Forward View for Mental Health (Mental Health Taskforce, 2016). In a comprehensive meta-analysis of 64 published articles, Barak, Hen, Boniel-Nissim, and Shapira, (2008) found strong support for the use of online psychological interventions, with an overall medium effect size (0.53), comparable to face-to-face interventions.

A qualitative exploration of internet use amongst individuals with psychosis, found the internet provided easy and fast access to a range of information, as well as specific advantages such as anonymity and an absence of hierarchy, which could overcome potential difficulties with social interactions seen in this population (Schrack, Sibitz, Unger, & Amering, 2010). There have been few studies exploring online interventions in relation to symptoms of psychosis. Preliminary studies indicate that CBT interventions delivered online have utility in supporting individuals with sub-clinical psychotic-like experiences, (Stafford, Hides, & Kavanagh, 2015) and are feasible in supporting individuals who experience hallucinations (Gottlieb, Romeo, Penn, Mueser, & Chiko, 2013). A narrative review Álvarez-Jiménez et al. (2012) concluded that online interventions are acceptable to individuals with psychosis. Furthermore, there is evidence that internet samples are diverse and potentially more representative of the general population than traditional research methods (Gosling, Vazire, Srivastava, & John, 2004).

A recent experimental study specifically exploring the effects of an online attachment-based imagery intervention on paranoia and mood in a population of 301 undergraduates, found secure attachment imagery was associated with lower paranoia, anxiety and negative mood, compared to anxious-ambivalent imagery (Newman-Taylor, Kemp, Potter, & Au-Yeung, 2017). Although the intervention was found to be accessible,

the results are not generalisable as the study utilised a low-paranoia sample limited to a student population, and did not include any follow-up measures.

Overall, online interventions are arguably more accessible to a wider population, and may be more acceptable to individuals with psychosis who often experience difficulties with social interactions and accessing traditional mental health services. Delivery of interventions online may be more cost-effective when compared to one-to-one or group therapy sessions, or alternatively could be used alongside such therapies to improve outcomes.

It is possible that online interventions are not as effective as face-to-face interventions, e.g. as delivered by Bullock et al. (2016). It is widely acknowledged that a key active component across psychological therapies is the therapeutic relationship (Lambert & Barley, 2001; Wampold, 2015), which is missing with an online format. Additionally, some individuals may have difficulty accessing the internet on a regular basis, due to financial difficulties or in some cases symptoms of psychosis that may specifically relate to the use of technology, such as paranoia about others watching them on the computer. Nonetheless, there is evidence that online interventions are helpful in psychosis populations (Gottlieb et al., 2013) and can reduce levels of paranoia in a non-clinical group (Newman-Taylor et al., 2017), and therefore may be an important addition in the toolbox of treatments for this population.

The present study aimed to explore the use of an online secure-attachment imagery intervention, in a high-paranoia sample from the general population following one dose and at follow-up. Study two aimed to explore the impact of a secure attachment imagery intervention on clinical levels of paranoia, utilising a single-case series approach.

## **2.3 Study One**

### **2.3.1 Aims**

The pilot study aimed to examine the feasibility of an online imagery intervention in the general population over a one-week period. Paranoia can be observed across a spectrum from non-clinical to clinical populations, and high levels of paranoia can have a significant impact on quality of life. Therefore, paranoia is the primary outcome of the study. We know that paranoia can also lead to significant distress for individuals, which is included as a secondary outcome. Thus, study one also aimed to explore the impact of an online secure and insecure attachment imagery intervention on paranoia and affect, in participants with high levels of non-clinical paranoia.

### **2.3.2 Hypotheses**

1. It is hypothesised that the online intervention will be feasible, with low attrition rates (withdrawal or drop-out of participants) across a seven-day follow-up period.
2. The secure attachment online imagery task will be associated with a decrease paranoia and improved affect in a high paranoia, non-clinical population.
3. Conversely, the insecure attachment online imagery task will be associated with an increase paranoia and reduce affect.

### **2.3.3 Method**

#### **2.3.3.1 Design**

The pilot study used an experimental between-groups and repeated measures design. The within-subjects variable was time (pre and post imagery task) and the between-subjects variable was type of attachment imagery (secure/insecure).

The sample size was based on recommendations for pilot studies within the literature, which suggest samples ranging between 10 -40 participants (e.g. Hertzog, 2008;



Isaac & Michael, 1995). Several authors recommend a general ‘rule of 12’ for continuous variables, to improve confidence intervals (e.g. Moore, Carter, Nietert, & Stewart, 2011; van Belle, 2002). In addition, a minimum sample size of 12 was calculated using a free online calculator, G\*Power (Faul, Erdfelder, Bucher, & Lang, 2009; see Appendix B for output) for a Mixed Analysis of Variance (ANOVA), with a confidence of 0.95 and an estimated effect size of  $\eta^2_p = 0.77$ , taken from previous published findings of an interaction effect between attachment imagery group and time (Bullock et al., 2016). The effect size from Bullock et al. (2016) was applied, as the present study utilised a similar guided-imagery intervention, although in an online format instead of face-to-face, and was in a similar population, i.e. general population with high sub-clinical paranoia.

### **2.3.3.2 Participants**

Participants were adults aged 18 years or older from the general population. They were recruited through poster advertisements and online adverts at the university, as well as through open websites, (<http://psych.hanover.edu/research/exponnet.html> and <https://www.psychforums.com>), social media (Facebook, Twitter, and Instagram), and email. All adverts provided a direct link to the study and individuals were invited to share the study advert via a snowballing approach.

Participants were screened for trait paranoia using the Paranoia Scale (PS; Fenigstein & Venable, 1992). Due the present study being a pilot study and recruiting a smaller sample size, the study aimed to recruit individuals with high levels of sub-clinical paranoia. The aim was to increase chances of observing any potential effects of the intervention, in line with previous research (Bullock et al., 2016). Bullock et al. (2016) had found effects using a cut-off of 1SD above the mean; however, this was in a larger sample size. Thus to increase our recruitment and maintain a higher paranoia sample, normative scores in a non-clinical population ( $M = 42.7$ ,  $SD = 10.2$ ; Fenigstein & Venable, 1992) were used as a conservative cut-off to identify individuals with higher levels of trait paranoia.

Therefore, participants who scored above average ( $<43$ ) on the PS were included in the study. Overall, 51 participants took part in the screening questionnaire.

Participants who took part in the full study were offered the chance to be entered into a prize draw to win a £40 Amazon voucher. Students from the University of Southampton were offered the choice to receive course credits or to be entered into the prize draw.

### 2.3.3.3 *Measures*

***Demographic information.*** Data was collected on participants gender, age, and ethnicity.

***Feasibility.*** Participant attrition was recorded across the week as a measure of feasibility. Although there is no standardised cut-off rate to indicate acceptable attrition rates, there is evidence that attrition of 20% or greater indicate possible threats to the validity of the study and concerns about potential bias (Schulz & Grimes, 2002). Therefore, for the purposes of this study, attrition rates below 20% will be considered to be within an acceptable range. Feasibility was also measured using duration of time individuals spent on the audio clip webpage, as an approximate measure of participants' compliance with the imagery intervention. The audio clips lasted for approximately 240 seconds.

***Trait Paranoia.*** The Paranoia Scale (PS; Fenigstein & Vanable, 1992; Appendix C) was administered as a screening questionnaire with 17-items assessing paranoia on a 5-point Likert scale from 1 (not at all applicable to me) to 5 (extremely applicable to me). The measure is designed for use in non-clinical populations and has demonstrated good internal consistency ( $\alpha = .84$ ; Fenigstein & Vanable, 1992). Internal consistency in the current sample was good ( $\alpha = .83$ ).

***Trait Attachment.*** An adapted version of the Experiences in Close Relationships inventory (Brennan et al., 1998) was administered. The questionnaire was adapted to measure attachment to close others, instead of a measure of romantic partner relationships

(Carnelley, Otway, & Rowe, 2016; Appendix D), which can be problematic for individuals who experience paranoia.<sup>4</sup> The measure has two 18-item subscales; attachment avoidance and attachment anxiety. Individuals rate each item on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Both subscales have demonstrated good internal consistency (attachment anxiety  $\alpha = .92$ , attachment avoidance  $\alpha = .95$ ; Carnelley et al., 2016). In the current sample the anxiety scale demonstrated good reliability ( $\alpha = .84$ ), whilst the avoidance scale demonstrated poor reliability ( $\alpha = .58$ ).

***Trait Mood.*** To assess for trait mood the Depression, Anxiety, Stress Scale was administered (DASS; Lovibond & Lovibond, 1995b; Appendix E). The DASS is a 42-item self-report measure, with participants rating statements on a 4-point scale from 0 (did not apply to me at all), to 3 (applied to me very much, or most of the time). The questionnaire can be separated into three subscales; Depression, Anxiety, and Stress. An overall negative mood score can be obtained by combining the mean of the subscales. Each subscale has shown adequate internal reliability (Depression  $\alpha = .91$ ; Anxiety  $\alpha = .84$ ; Stress  $\alpha = .89$ ; (Lovibond & Lovibond, 1995a). In the current sample the overall questionnaire demonstrated excellent internal consistency ( $\alpha = .94$ ).

***State Paranoia.*** A state-adapted version of the Paranoia Checklist (PC; Freeman et al., 2005) was administered (Adapted Paranoia Checklist; Lincoln, Lange, Burau, Exner, & Moritz, 2010; Appendix F). The measure consists of 18-items rated on a 5-point Likert scale, with a total possible score ranging from 18-90. The state-adapted version has demonstrated excellent internal consistency ( $\alpha = .95$ ; Schlier, Moritz, & Lincoln, 2016). In the current sample it showed excellent reliability pre-intervention ( $\alpha = .94$ ) and good reliability post-intervention ( $\alpha = .80$ ).

***State Mood.*** The Positive and Negative Affect Scale was used as a measure of state affect (PANAS; Watson, Clark, & Tellegen, 1988; Appendix G). The PANAS has two 10-

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<sup>4</sup> In one Australian national study 61.2% of individuals with psychosis reported as single/never married (Stain et al., 2012).

item subscales; positive affect (PA) and negative affect (NA). Participants are asked to rate each emotion according to their present feelings, on a 5-point scale. Higher scores indicate more positive or more negative affect and the scales have demonstrated good reliability in non-clinical populations (PA  $\alpha = .89$ , NA  $\alpha = .85$ ; Crawford & Henry, 2004). The subscales showed good internal consistency in the current sample pre-intervention (PA  $\alpha = .87$ , NA  $\alpha = .85$ ) and post-intervention (PA  $\alpha = .85$ , NA  $\alpha = .85$ ).

#### **2.3.3.4 Intervention**

Participants were randomly assigned to one of two imagery conditions; secure attachment and insecure attachment. The secure condition involved listening to a four-minute audio clip of a guided imagery task, prompting individuals to recall a time when they felt safe and secure with at least one other person (Appendix H). The insecure condition involved listening to a four-minute audio clip, prompting participants to recall a situation when they were with at least one other person and felt unsafe or distrusting (Appendix I). The scripts for both conditions were adapted from previous work exploring priming in social phobia (Hirsch, Clark, Mathews, & Williams, 2003).

To check the effectiveness of the imagery manipulation participants were asked to indicate the percentage of time the image was held in mind from 0 % (none of the time) to 100% (all of the time); and to rank the vividness of the image from 0 (not at all vivid) to 10 (extremely vivid). In addition, the 10-item version of the Felt Security Scale was utilised, which has excellent reliability ( $\alpha = .96$ ; Luke, Sedikides, & Carnelley, 2012). Reliability in the current sample was found to be excellent ( $\alpha = .99$ ). Currently, there are no reported validity scores for this measure, although it has been used in studies with a similar design to the present study (e.g. Newman-Taylor et al., 2017). The scale asks participants to rate how much they felt specific emotions/experiences when thinking about the person/people from the imagery task, on a scale from 1 (not at all) to 6 (very much).

### 2.3.4 Procedure

The intervention was completed online using a University of Southampton platform for online interventions (“The Lifeguide Authoring Software,” 2018). The software package is designed to support researchers with no programming expertise to use internet-based interventions, as has been utilised for multiple health-related research projects (e.g., Arden-Close et al., 2015; Band et al., 2017; Santer et al., 2014).

Participants were required to register with the study using an email address and password (Appendix J). Participants read the information sheet (Appendix K) and consent (Appendix J) was a prerequisite for participating in the study (see Figure 5 for an illustration of participant flow through the study). Participants completed the screening questionnaire and those who did not meet criteria were thanked for participating in the study. Those who scored above 43 on the Paranoia Scale then completed the additional trait and state measures (see Appendix J for example screenshots of the questionnaire pages). They were then randomised to attachment imagery condition (using the online program from the University of Southampton), where they listened to a four-minute audio clip (see Appendix J for example screenshot of this webpage). All participants then completed the state measures and imagery manipulation checks (see Appendix J). Finally, participants completed a mood repair task, where they were asked to name five of the best things in their life, a standard mood repair task utilised in many research protocols (e.g. Carnelley et al., 2016).

Following day one participants were then prompted with daily email reminders to complete the pre-intervention state measures, their assigned imagery intervention, post-intervention measures and mood repair task, for six further days. On the seventh day, all trait measures were repeated, participants were provided with the debrief statement (Appendix L) and thanked for their participation.

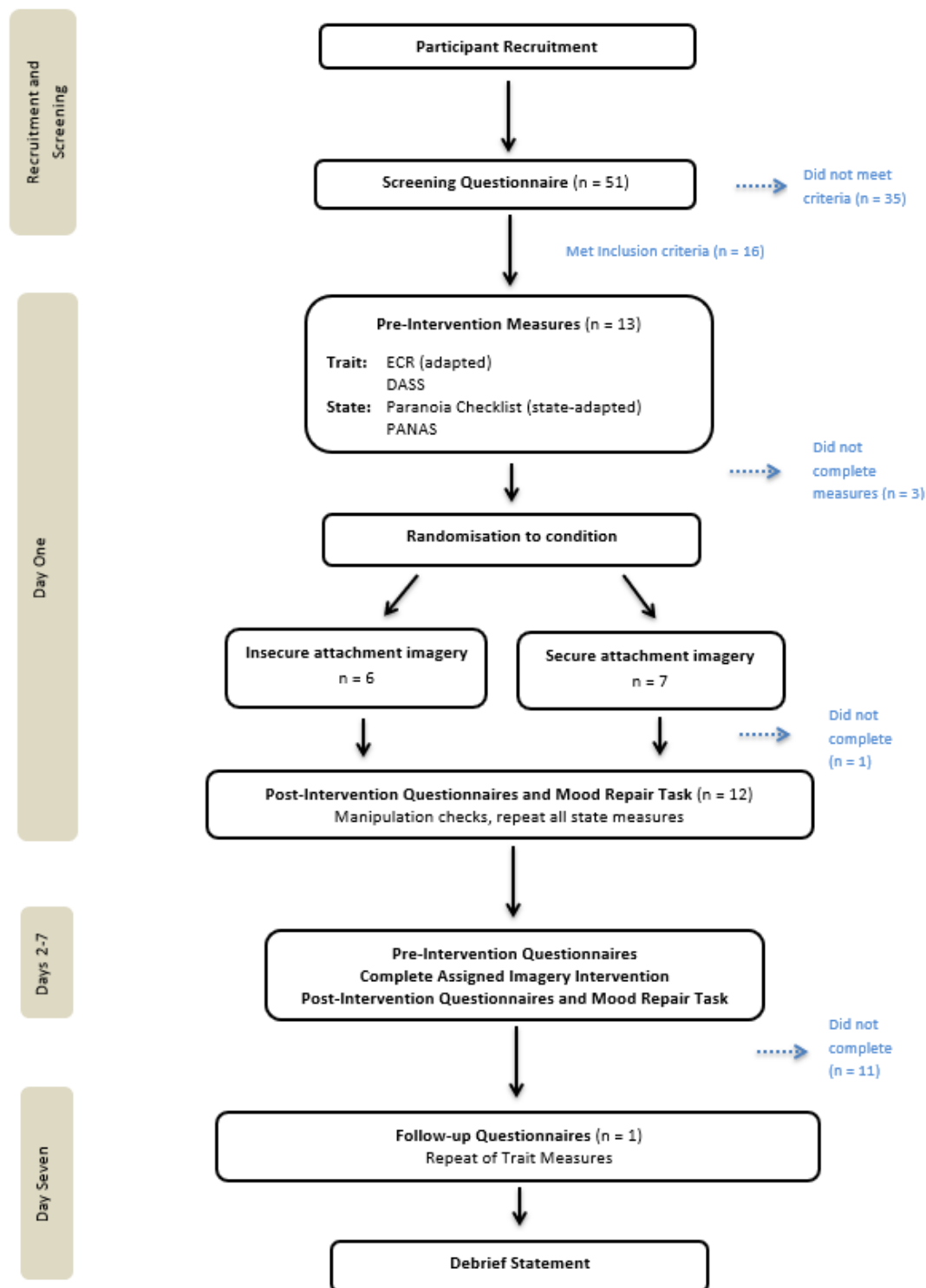


Figure 5. Flow diagram of participant progression through pilot study one

### **2.3.5 Data Analytic Procedure**

Data were analysed using the statistical package IBM SPSS 24 for Windows. Data was tested for outliers, normality and homogeneity of variance using visual inspection, Shaprio-Wilks test for normality, z-scores for skewness and kurtosis, and the Levene's test of homogeneity of variance. Where data was found to violate assumptions of normality, non-parametric alternatives were used.

T-tests and chi-square were conducted on demographic variables to examine group differences. Two-way mixed Analysis of Variances (ANOVA) were conducted to explore the main hypotheses, using one between-subjects factor (secure/insecure imagery) and one within-subjects factor (pre- and post-intervention; see Appendix M for key SPSS outputs). Several correlations were found between some of the variables (Appendix N) meaning that Analysis of Covariance (ANCOVA's) would be indicated. However, the small sample size in the present study precludes this analysis.

### **2.3.6 Ethics**

The study received ethical approval from University of Southampton's Ethics and Research Governance Committees (ERGO: 30332).

Participants were required to read the information sheet and provide informed consent prior to taking part. They were made aware that they could withdraw from the study at any time. All participant data, including email addresses, were stored securely and in line with data protection procedures.

Due to the potential for the insecure imagery task to reduce mood and increase paranoia, a mood repair task was included at the end of each session. At the end of the study participants were provided with a debriefing statement which included information on where to seek further support if required.

## 2.3.7 Results

### 2.3.7.1 Feasibility of Follow-up Study and Imagery Interventions

Drop-out rates for the one-week follow-up study were high, with only one participant completing all seven days. Figure 6 illustrates the number of participants completing each day of the pilot study by imagery condition, and indicates there was significant drop-out following the first day in both conditions. In the insecure imagery condition, none completed the full seven days and one participant completed six days. In the secure imagery condition one participant completed the full study and one completed six days. Overall, attrition rates between day one and seven for the secure group were 86% and for the insecure group were 80%, which are significantly higher than the acceptable cut-off of 20% attrition. Due to the small sample size it is not possible to examine differences between groups, but it is clear that attrition rates were high in both conditions.

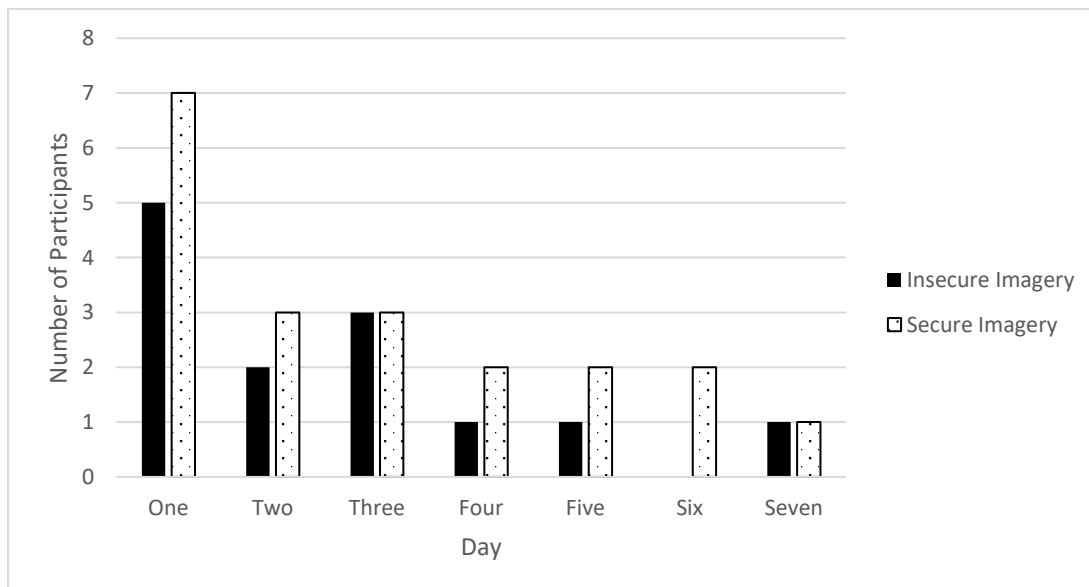
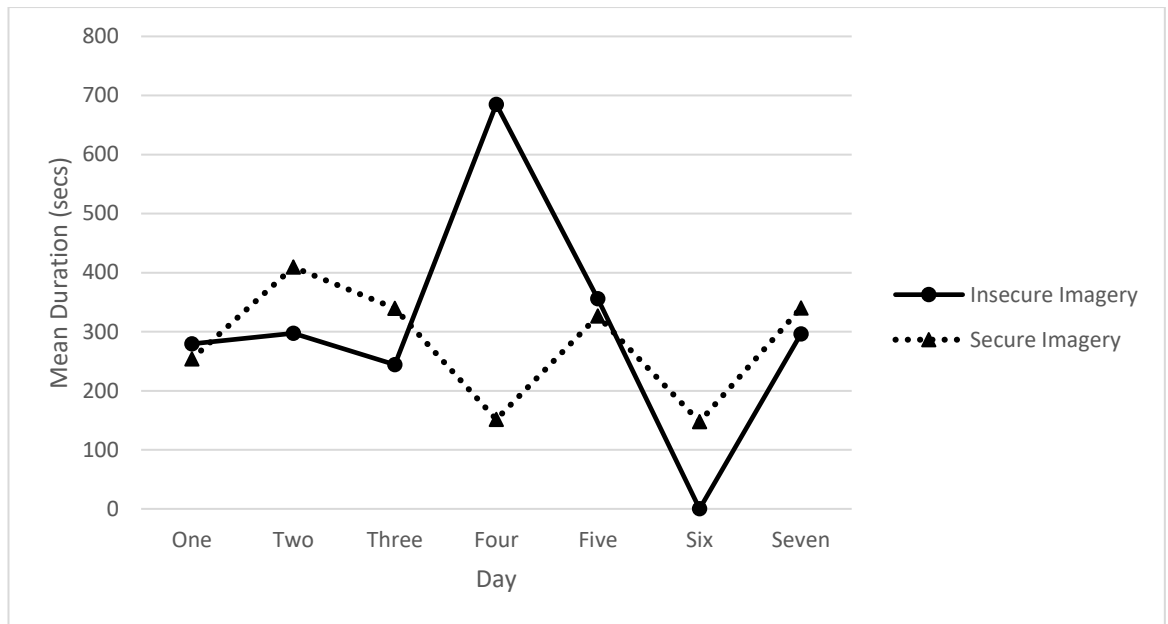


Figure 6. Number of participants completing intervention and questionnaires per day

The mean duration of time on the audio clip webpage was variable across days and conditions (Figure 7). Visual inspection of the data shows potentially greater variation in time on the audio clip page in the insecure imagery condition, although this data is likely to be skewed by the limited number of participants completing days four to seven.





*Figure 7.* Mean duration of time (seconds) spent on audio clip webpage by imagery condition

Due to high drop-out rates, follow-up data was excluded from further data analysis. The following results will focus on data collected from day one to explore the impact of imagery intervention on paranoia and mood.

#### **2.3.7.2 Descriptive Statistics**

Table 5 illustrates the demographic data by group. Comparison tests found there were no significant differences in age  $t(10) = -0.257, p = 0.802$ , ethnicity  $\chi^2(1) = 1.527, p = 0.217$ , or gender  $\chi^2(1) = 0.010, p = 0.921$  between groups. Thus, the randomisation procedure was robust.

Table 5

*Demographic Information by Condition*

		Insecure Imagery	Secure Imagery
<u>Age (years)</u>	Mean (SD)	32 (3.87)	32.43 (4.24)
	Range	27-36	27-38
<u>Gender</u>	Male	2	3
	Female	3	4
<u>Ethnicity</u>	White British	4	7
	White Other	1	0

The groups were also compared for differences in trait outcome measures (Table 6).

No significant differences were found on the measures of trait paranoia, mood, or attachment.

Table 6

*Trait Measure Scores by Condition and Group Comparisons*

Measure	<u>Condition</u>		<i>t(df)</i>	<i>U</i>	<i>p</i>
	Insecure Imagery	Secure Imagery			
	<i>M(SD)</i>	<i>M(SD)</i>			
Paranoia Scale	55.00 (9.72)	54.29 (11.57)	-	17*	1.000
DASS	31.40 (10.26)	38.71 (21.86)	-0.69 (10)	-	0.507
ECR					
Avoidance Subscale	65.4 (5.18)	61.86 (15.90)	0.48 (10)	-	0.645
Anxiety Subscale	67.40 (23.93)	71.86 (23.59)	-	15*	0.755

*Note.* Independent T-tests performed for data that met assumptions of normality; \*Mann Whitney-U performed for data found to be non-normally distributed

**2.3.7.3 Imagery Manipulation**

The imagery manipulation checks revealed an average vividness rating across groups  $M = 6.42$  (Range = 2-10) and an average percentage of time holding the image in mind across groups  $M = 44.25$  (Range = 0-99%).

Table 7 outlines the imagery manipulation scores by condition and reveals no significant difference between groups. Thus, imagery type did not impact on the vividness of the image or percentage of time participants could hold the image in mind.

Table 7

*Imagery Manipulation Scores by Condition and Group Comparisons*

	Condition				
Measure	Insecure Imagery	Secure Imagery	<i>t(df)</i>	<i>U</i>	<i>p</i>
<u>Vividness of image</u>					
Mean (SD)	7.00 (3.00)	6.00 (1.53)	-	9.00*	0.202
Range	2-10	3-7			
<u>% time image held in mind</u>					
Mean (SD)	46.60 (44.86)	42.57 (31.42)	0.18 (10)	-	0.858
Range	0-99	0-71			
<u>Felt Security Questionnaire</u>					
Mean (SD)	28.20 (15.01)	46.00 (10.66)	- 2.42 (10)	-	<b>0.036</b>
Range	11-51	30-58			

*Note.* Independent T-tests performed for data that met assumptions of normality; \*Mann Whitney-U performed for data found to be non-normally distributed

The insecure group was found to score significantly lower on the felt security questionnaire, compared to the secure group  $t(10) = -2.42$ ,  $p = 0.036$ ,  $d = 1.37$ . Thus, the imagery manipulation was successful in changing felt security, with a very large effect size (Sawilowsky, 2009).

#### 2.3.7.4 Group Differences

Table 8 illustrates the group means and group comparisons for all state measures pre- and post-imagery intervention.

Table 8

*State Measure Scores by Condition*

Measure	Condition	N	<u>Time</u>	
			Pre <i>M (SD)</i>	Post <i>M (SD)</i>
<u>Paranoia Checklist</u>	Insecure	5	35.20 (8.58)	32.40 (6.11)
	Secure	7	37.71 (17.67)	29.28 (6.63)
<u>PANAS Negative</u>	Insecure	5	16.20 (4.15)	16.20 (3.90)
	Secure	7	17.86 (7.58)	16.86 (6.52)
<u>PANAS Positive</u>	Insecure	5	23.40 (8.68)	22.40 (9.53)
	Secure	7	26.00 (7.72)	25.00 (5.66)

**State Paranoia.** Data for the Paranoia Checklist pre-intervention within the secure group, was found to violate the assumptions of normality, as tested by the Shapiro-Wilk's test ( $W = 0.807$ ,  $p = 0.048$ ) and z-scores for skewness ( $z = 2.25$ ) and kurtosis ( $z = 2.09$ ) above the critical value of  $\pm 1.96$ . However, ANOVA's are considered to be reasonably robust to slight violations of normality (Field, 2009).

Therefore, a two-way mixed Analysis of Variance (ANOVA) was conducted within the context of its limitations, to investigate the impact of imagery condition and time on paranoia score. There was not a significant main effect of time,  $F(1, 10) = 0.185$ ,  $p = 0.203$ . or imagery condition,  $F(1, 10) = 0.00$ ,  $p = 0.955$ . Additionally, there was not a significant interaction between time and imagery condition,  $F(1, 10) = 0.47$ ,  $p = 0.510$  (Figure 8).

**State Negative Affect.** A two-way mixed ANOVA was conducted to investigate the impact of imagery condition and time on negative affect. There was no main effect of time,  $F(1, 10) = 0.18$ ,  $p = 0.682$ , or imagery condition,  $F(1, 10) = 0.12$ ,  $p = 0.736$ . Furthermore, there was no interaction found between time and imagery condition,  $F(1, 10) = 0.18$ ,  $p = 0.682$  (see Figure 9).

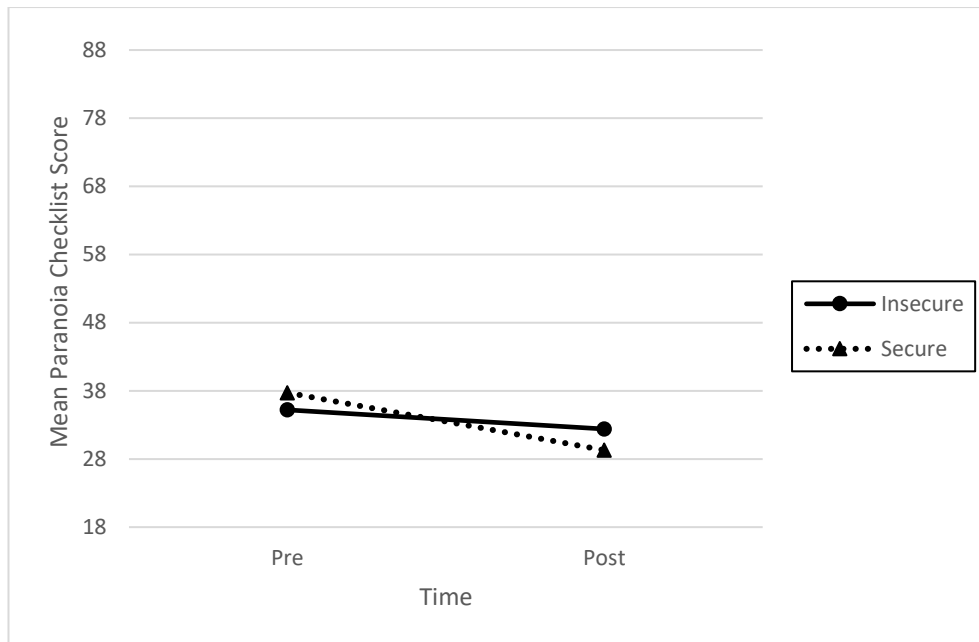


Figure 8. Mean scores on the Paranoia Checklist over time, by imagery condition

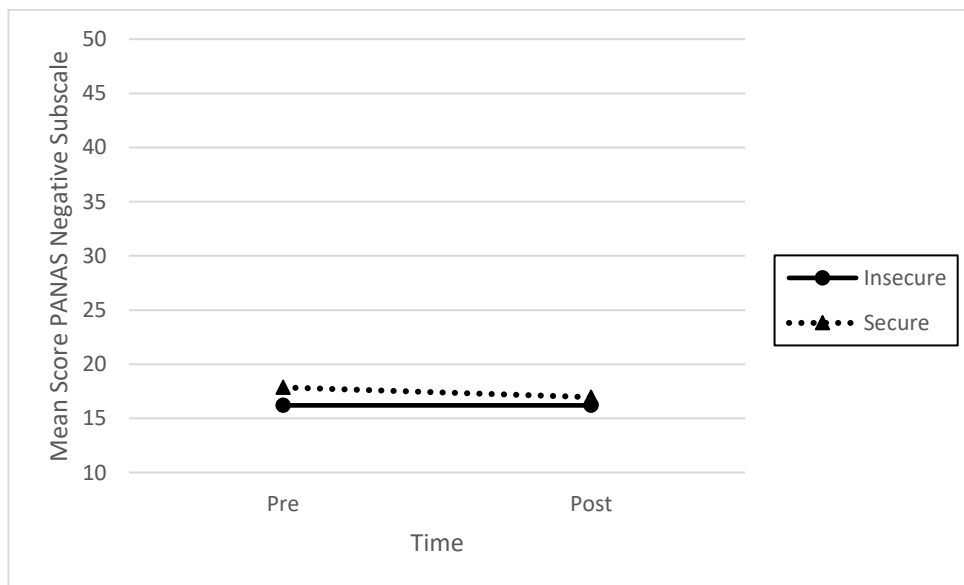


Figure 9. Mean scores on the PANAS negative subscale over time, by imagery condition

**State Positive Affect.** A two-way mixed ANOVA was performed to explore the impact of imagery condition and time on positive affect. There was no main effect of time,  $F(1, 10) = 0.21, p = 0.654$ . There was also no significant main effect of group,  $F(1, 10) = 0.419, p = 0.532$  and no interaction effect between time and imagery condition,  $F(1, 10) = 0.00, p = 1.00$  (see Figure 10).

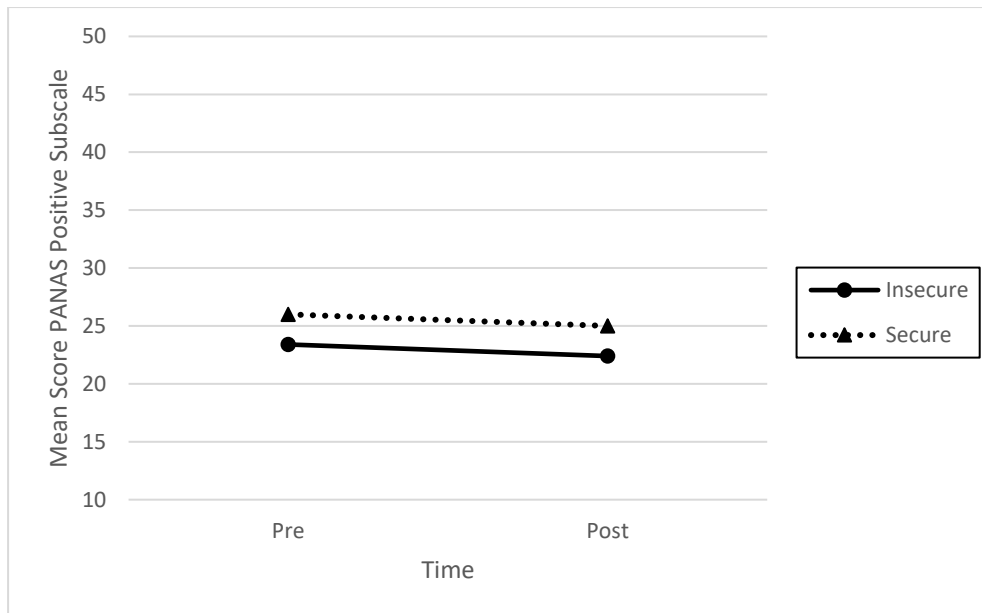


Figure 10. Means scores on PANAS positive subscale over time, by imagery condition

## 2.4 Study Two

### 2.4.1 Introduction

Study one did not find support for the use of an online secure-attachment imagery intervention in sub-clinical paranoia. However, there is evidence for the use of secure-attachment imagery face-to-face in an analogue population with large effect sizes found ( $\eta^2_p = 0.77$ ; Bullock et al., 2016). Although paranoia is conceptualised to exist along a continuum (Elahi et al., 2017), there are significant differences between non-clinical and clinical populations. Higher paranoia is associated with increased emotional and avoidant coping, negative attitudes to emotions, and lower social comparisons (Freeman et al., 2005). Clinical populations are also associated with higher attachment insecurity and larger variations in this over time (Sitko et al., 2016). Furthermore, as the intervention is currently untested in a clinical population it is important to establish its effectiveness face-to-face.

Psychotic symptoms are often associated with negative affect, for instance 50% of patients with schizophrenia have co-morbid depression (Buckley, Miller, Lehrer, & Castle,

2009), and negative mood has been implicated in the development of paranoia symptoms (Fowler et al., 2012). Furthermore, affect processes have been implicated as a key component of internal working models, described in attachment theory, and could differentiate these from core beliefs (Berry, Barrowclough, & Wearden, 2009), outlined in cognitive theories. Thus, it was felt that measuring affect would be beneficial in both examining the effects of the intervention on participants symptoms, and also in distinguishing between potential underlying mechanisms, i.e. attachment processes or cognitive processes.

### **2.4.2 Aims**

In the first study of its kind, study two aimed to examine the impact of a secure attachment imagery task on paranoia and affect in clinical participants.

### **2.4.3 Hypotheses**

The secure attachment guided imagery task will be associated with a decrease paranoia and improved mood during intervention in a clinical population and effects will be maintained at follow-up.

### **2.4.4 Method**

#### **2.4.4.1 Design.**

A single case series using a multiple baseline A-B-A design, with matched follow-up was utilised. This is a powerful design allowing us to draw robust inferences about intervention effectiveness (Morley, 2018). Participants were recruited for a six-week time period, with a randomised baseline length between 1-4 weeks, a one-week intervention phase, and a follow-up phase matched to baseline length, e.g., if the baseline was one week, the intervention phase was one week and the follow-up phase would be four weeks. The independent variable was secure-attachment imagery, and the dependent variables were paranoia and affect.

#### **2.4.4.2 Participants.**

Participants were recruited between April and July 2018 from Community Mental Health Teams (CMHTs) and Early Intervention in Psychosis Teams (EIPs) within an NHS Trust in the South of England. The teams were contacted with information about the study and care co-ordinators were asked to identify patients who met the following inclusion criteria:

- Aged between 18 and 65 years old.
- Have a non-organic diagnosis of schizophrenia or schizoaffective disorder as defined by the International Classification of Diseases-10 (ICD-10, World Health Organisation, 1992) or meet criteria for one of these diagnoses (as confirmed by their psychiatrist).
- Must be experiencing current symptoms of paranoia.
- Have an assigned care co-ordinator.
- Have proficiency in the English language.
- Must have capacity to consent to participate and not at high risk of harm to self or others (as agreed by their care co-ordinator).
- Not currently participating in another psychological therapy.

Four individuals who met criteria were approached to participate in the study. All were provided with information on the study (Appendix O) and were asked to provide informed written consent (Appendix P). Two declined to participate due to work commitments and uncertainty about the use of imagery techniques. Thus, two participants, one female and one male completed the study. A sample size of two is consistent with high quality published single-case research (see examples; Townend, 2003; Wain, Kneebone, & Cropley, 2011), including in psychosis populations (Newman Taylor, Harper, & Chadwick, 2009).



**Participant One.** A 56-year-old, White-English male who described himself as retired and single, with 12 years of formal education. He reported a complex physical health history including; Cauda Equina Syndrome, chronic pain, and arthritis. He was diagnosed with paranoid and catatonic Schizophrenia three years previously and was currently experiencing a range of associated symptoms including; visual hallucinations, auditory hallucinations, paranoia, and passivity. He described these symptoms as having a ‘*big impact*’ on his social life and result in him ‘*mostly staying in the house.*’ He reported diagnoses of social anxiety disorder and depression, although he felt the latter was under-control. He was taking a range of medication including two anti-psychotics (Paliperidone and Amisulpride), an anti-depressant (Lofepramine), pain killers (Gabopentin and Zapain) and medication to lower cholesterol and blood pressure. He reported having very little psychological input, although four months prior to the study had completed approximately 6-7 sessions of mindfulness, which included some visualisation techniques. However, he felt that this was not helpful and at the time of the present study was not using any of the strategies learned.

**Participant Two.** A 51-year-old, Indian female who was unemployed and single at the time of the study. She had spent 25 years in formal education including completion of a degree. She received her diagnosis of Schizophrenia around eight years prior. She was experiencing auditory hallucinations, paranoia, depression, anxiety, and unusual physical sensations. She described this as impacting on her ‘*ability to think, feel, and behave like myself*’ as well as engage with people, activities and sleep. She was not currently taking any medication and reported no other mental health conditions. Previous psychological input included six months of CBT for psychosis and anxiety (completed three years prior), over three years of counselling for depression (completed 20 years prior), and a six-week group for psychosis and anxiety (completed 18 months prior). She reported these were helpful for her but did not recall using any type of imagery exercises within these.

#### **2.4.4.3 Therapist.**

The therapist (author) was a 31-year-old, White-British female trainee Clinical Psychologist. She was in her third year of study, and as she was not yet qualified was supervised by two experienced Clinical Psychologists.

#### **2.4.4.4 Measures.**

**Demographic and Clinical Questionnaire.** Inclusive of questions about the participant's age, gender, ethnicity, employment status, marital status, and years spent in formal education. Further questions explored clinically relevant information (Appendix Q).

**Trait Paranoia.** The Green Paranoia Thoughts Scale (GPTS; Green et al., 2008; Appendix R), a self-rated measure of trait paranoia validated for use in clinical populations, was administered. It includes 31-items rated on a 5-point Likert scale, referring to symptoms experienced over the past month. The GPTS is a reliable tool with good internal consistency ( $\alpha = .90$ ; Green et al., 2008). Green et al., (2008) found that the scales were correlated with the Paranoia Scale and Peter's Delusion Inventory in a non-clinical population, and with the Paranoia Scale and Psychotic Symptom Rating Scales (Delusion Subscale) in the clinical population, demonstrating that the measure has good concurrent and convergent validity. Comparison of the non-clinical and clinical groups indicated significantly higher scores in the clinical group, although there was some overlap in scores, indicative of good criterion validity (Green et al., 2008).

**Trait Attachment.** Adult attachment style was assessed using the Psychosis Attachment Measure (PAM; Berry et al., 2006; Appendix S). The PAM is a self-rated questionnaire with 16-items scored on a 4-point Likert scale. It is specifically adapted for use with individuals experiencing psychosis, in order to reduce the potential confounding effects of psychotic symptoms and avoid reference to romantic relationships. The two attachment dimensions measured show acceptable internal consistency; Anxiety ( $\alpha = .82$ )

and Avoidance ( $\alpha = .75$ ). The measure has been validated in a clinical population (Berry, Barrowclough, & Wearden, 2009).

***State Paranoia.*** In order to measure daily fluctuations, the state-adapted version of the Paranoia Checklist was chosen (Lincoln et al., 2010; Appendix T). To reduce participant burden, the brief five-item version was administered, which was found to be preferable to alternative shortened versions in psychosis populations, and demonstrates good internal consistency ( $\alpha = .83$ ; Schlier, Moritz, & Lincoln, 2016).

***State Affect.*** In order to measure ambulatory mood, the Positive and Negative Affect Scale (PANAS; Crawford & Henry, 2004; Appendix G) was utilised. This is a 20-item self-report measure, assessing positive and negative mood. The PANAS has been found to have good construct validity and be a reliable measure of both positive ( $\alpha = .89$ ) and negative affect ( $\alpha = .85$ ; Crawford & Henry, 2004). The PANAS has also been utilised in clinical populations (e.g. de Sousa, Sellwood, Spray, & Bentall, 2016; Sims, Barker, Price, & Fornells-Ambrojo, 2015).

***Manipulation Check.*** In order to check engagement in the imagery task, participants were also asked to rate the amount of time the image was held in mind on a scale from 1 (none of the time) to 10 (all of the time), and to rank the vividness of the image on a scale between 1 (not at all vivid) to 10 (extremely vivid).

***Qualitative Feedback.*** At the end of the study, participants were asked for feedback on the acceptability and effects of the intervention using a semi-structured questionnaire, completed with the researcher. They were asked to describe any changes they had noticed since taking part in the study, how they found completing the imagery task, and to rate how helpful they thought it was for them on a scale 1 (not at all helpful) to 10 (very helpful). There was also further space for additional comments and feedback.

#### **2.4.4.5 Intervention.**

The intervention was adapted from the positive self-imagery task utilised in Bullock, Newman-Taylor, and Stopa's (2016) study. Participants met with the researcher and a standardised script (Appendix U) was utilised to develop one vivid image of a secure attachment. Participants were asked to recall an interpersonal memory of a time when they felt relaxed, safe, secure and trusting. The researcher then used a standard script (Appendix V) adapted from Bullock et al., (2016) with prompts relating to the chosen memory, to develop an individualised audio clip of the guided imagery intervention. The duration of the audio clips was between four and five minutes.

#### **2.4.5 Procedure.**

Figure 11 illustrates the participant progression through the study. Following recruitment and screening, participants met with the researcher to complete the pre-intervention questionnaires. They were randomly assigned to a baseline length using an online randomisation tool (Haahr, 2017).

In single-case research, establishing a stable baseline prior to introducing an intervention is desirable and continuing data collection until there is limited variation around the mean can be used to determine an appropriate baseline length (Gast, 2010). However, this is not always possible in clinical settings.

The phase durations (between one and four weeks), in the present study were chosen to provide a balance between attaining a reasonable data set whilst also minimising participant burden and potential drop-out. Post-hoc calculations of variation around the baseline mean (Appendix W) revealed that the baseline variability of most measures for both participants was outside of the acceptable range (Morley, 2018).

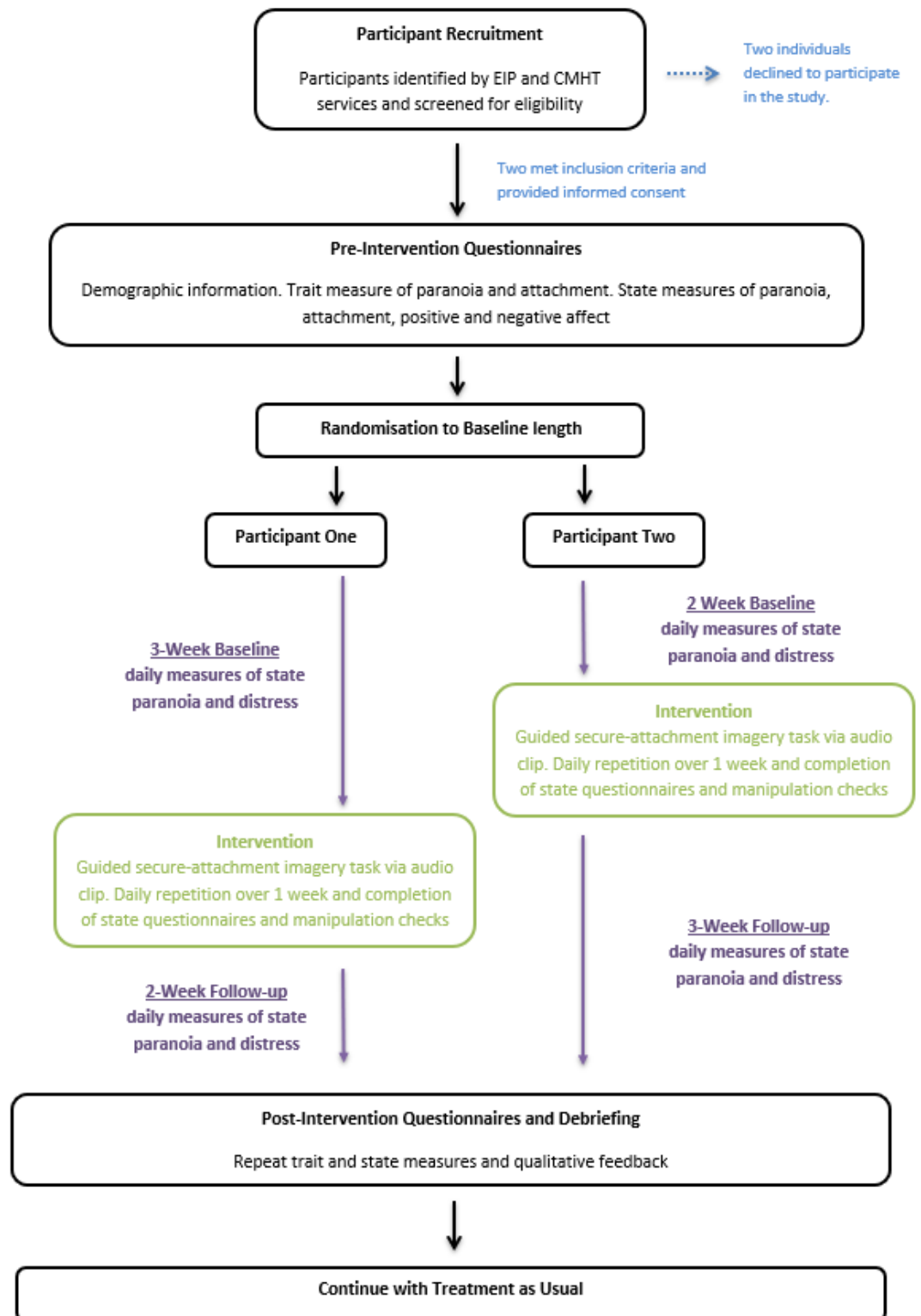


Figure 11. Flow diagram of participant progression through study two

However, individuals with psychosis are noted to have frequent fluctuations in symptoms (Bak, Drukker, Hasmi, & van Os, 2016). Thus, it would be challenging to establish a stable baseline in this population. In addition, according to single-case research standards specified by Kratochwill et al., (2010), an absolute minimum of three data points is required per phase, although the gold-standard minimum number is five data points. Therefore, seven data points were included minimum to allow for any missing data.

Participants were required to complete the state measures every day. Following baseline, participants met again with the researcher to develop their individualized guided imagery intervention and then listened to this every day for seven days. Finally, participants met with the researcher on the last day to complete trait and state measures, qualitative feedback and for debriefing (Appendix X). Participants also received a £30 cash payment as reimbursement for their time and effort.

The quality of study two's methodology was rated against the Single-Case Experimental Design (SCED) Scale (Tate et al., 2008), an 11-item scale rated by two independent raters. Both raters were Trainee Clinical Psychologists and although they had not used the scale before, an advantage of the scale is that it is designed to be used by individuals without specific training in administering it. The present study received method scores of 8/8 and 7/8 (two items were not applicable) and inter-rater agreement of 87.5%, indicating that the study used a robust design (see Appendix Y).

#### **2.4.6 Data Analytic Strategy.**

Traditional analysis of single-case research has been dominated by use of visual exploration of the data. However, there is evidence for significant observer bias when interpreting results using this methodology alone, with poor interrater reliability demonstrated (Ottenbacher, 1993). Furthermore, visual analysis relies on a stable baseline prior to introducing an experimental manipulation, which is difficult in applied contexts, such as in clinical populations with fluctuating symptoms. Therefore, more recently there

has been a shift towards the development of formal statistical tests in single-case studies that can remove the observer bias (Jones, Weinrott, & Vaught, 1978), account for a non-stable baseline, and detect smaller effects that may have been overlooked during visual inspection. As a result, key proponents of single-case research advocate for the application of both visual analysis and statistical analysis in partnership, with statistical analysis supporting visual inspection; not superseding it (Kratochwill, Levin, Horner, & Swoboda, 2014; Morley, 2018).

Standard visual and statistical analysis for single-case designs, as described by Morley (2018) were applied to the data including; visual exploration; Mood's Median Test, and Tau-U test. The Tau-U test was calculated using the online calculator at [www.singlecaseresearch.org](http://www.singlecaseresearch.org) (Vannest, Parker, & Gonen, 2011).

#### **2.4.7 Ethics.**

The study was designed to conform to the NHS code of Confidentiality (Department of Health, 2003) and the British Psychological Society's Code of Human Research and Ethics (BPS, 2014). Ethics approval was granted by the University of Southampton's Ethics and Research Governance Committees (Appendix Z), the NHS Research Ethics Committee (Appendix AA) and Health Research Authority (Appendix BB).

Care co-ordinators confirmed an individual's capacity to consent and informed written consent was gained from each participant. Importantly, the researcher liaised with each participants' care co-ordinators, who were available to provide participants with additional support if required. There were no adverse effects indicated by the participant's or their care co-ordinators. All data was anonymised using participant numbers and stored securely on password protected computers. The researcher was not able to access patient information through NHS databases.

## 2.4.8 Results

### 2.4.8.1 Participant One.

Participant one was randomised to a baseline length of three weeks and matched follow-up of two weeks. Descriptive statistics from the trait measures of paranoia (GPTS) and attachment style (PAM) are illustrated in table 9, and show he had an anxious attachment style, which was stable across time points. In addition, he showed high levels of paranoia.

Table 9

*Participant One Results on Trait Attachment and Paranoia Measures.*

Measure	Subscales	Pre	Interpretation	Post	Interpretation
PAM	Anxiety Total	1.75	-	2.5	-
	Avoidance Total	1.5	-	1.25	-
	Difference score	0.25	Anxious attachment	1.25	Anxious attachment
GPTS	Social Reference	50	Clinical	54	Clinical
	Persecution	60	Clinical	70	Clinical

*Note.* The GPTS was interpreted using non-clinical and clinical norms reported by Green et al., (2008).

Figure 12 illustrates his daily scores on the Paranoia Checklist, with a maximum possible score of 50 representing high levels of paranoia. The dashed line represents the broadened median score, calculated to reduce the impact of extreme scores. Visual analysis of the data shows evidence of a reduction in paranoia during the intervention phase, followed by a return to baseline scores at follow-up. Thus, indicating a possible effect of treatment in reducing paranoia, although this was not sustained at follow-up.



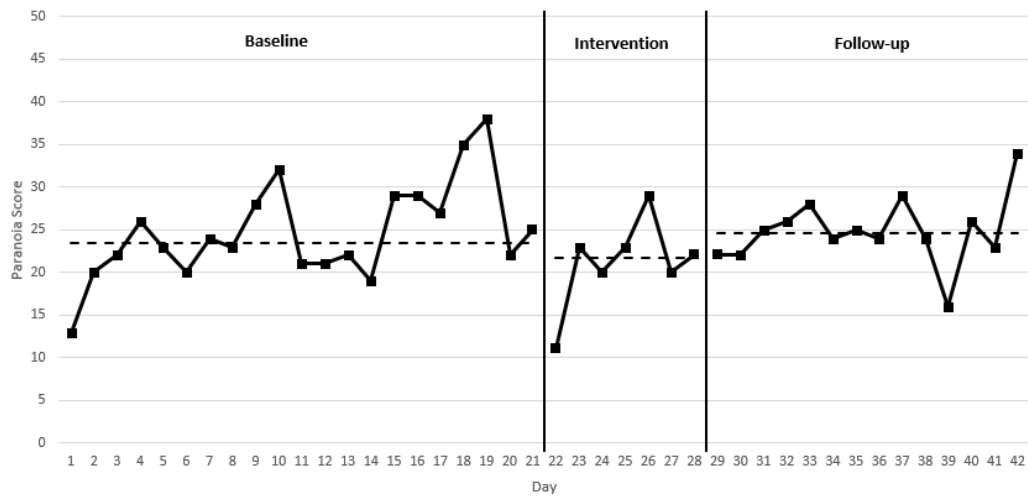


Figure 12. Participant one daily score and broadened median on the Paranoia Checklist

The variability of daily scores reduced during the intervention phase (Figure 13) and increased again at follow-up, but remained less than at baseline. Therefore, it may be that the some of the effects of the imagery intervention on variability in paranoia continue beyond the intervention.

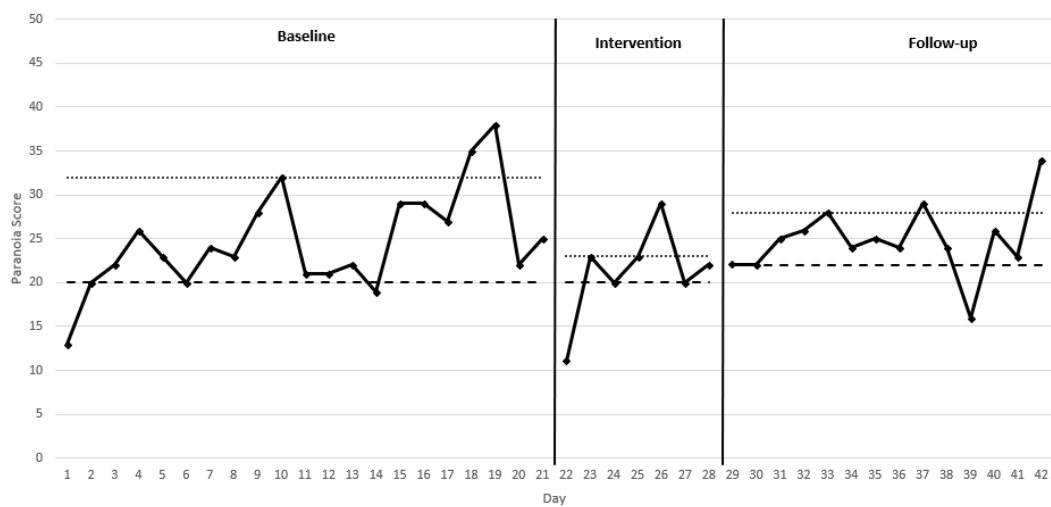
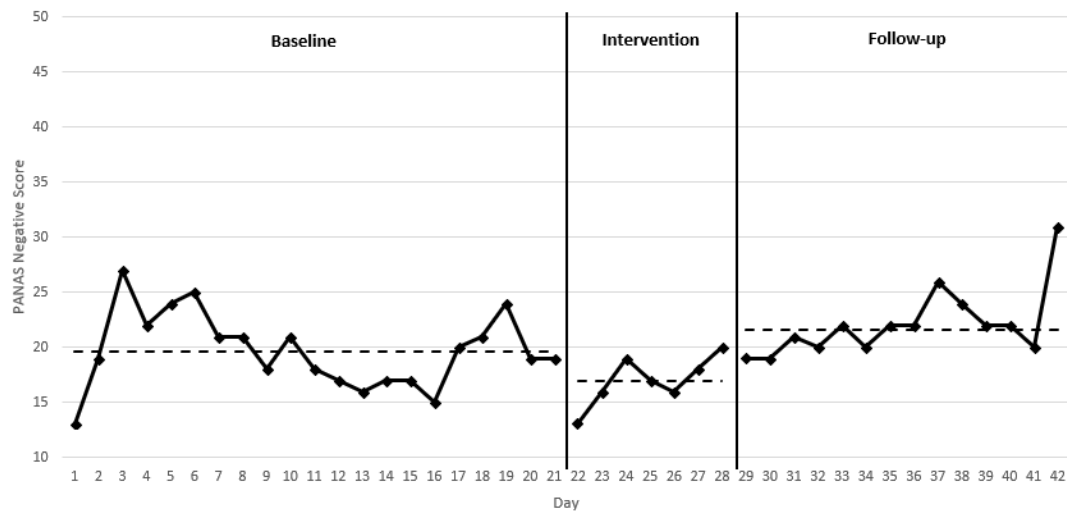
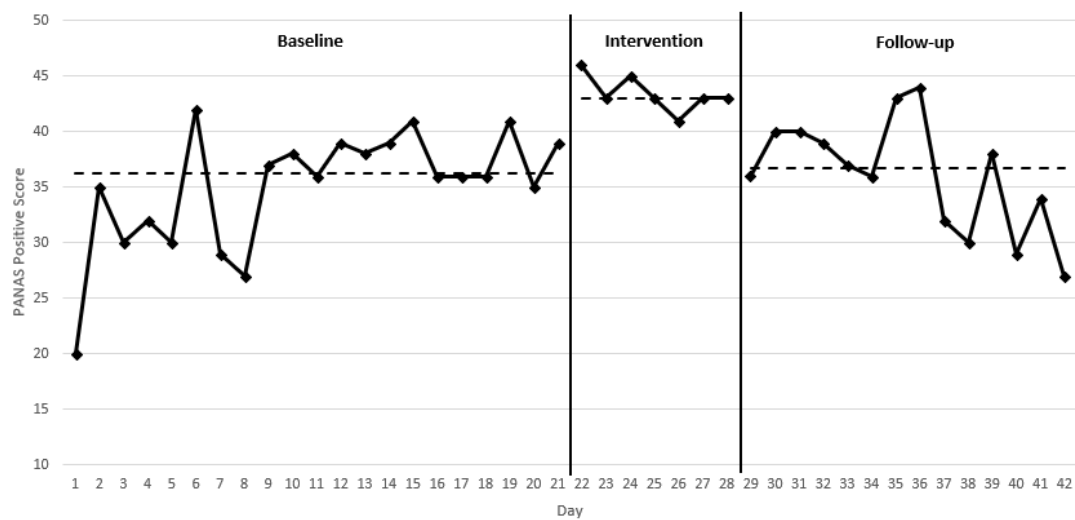


Figure 13. Participant one trimmed range for daily scores on the Paranoia Checklist

Similarly, visual analysis revealed a reduction in negative affect and an increase in positive affect scores during intervention, with a subsequent return to baseline scores during follow-up (Figures 14 and 15). Therefore, his mood appeared to improve during the week-long intervention phase.



*Figure 14.* Participant one daily score and broadened median on the PANAS negative subscale



*Figure 15.* Participant one daily score and broadened median on the PANAS positive subscale

The variability in scores across phases for both PANAS subscales reduced significantly during the intervention phase and increased again at follow-up, although slightly less than baseline variability (Figures 16 and 17).

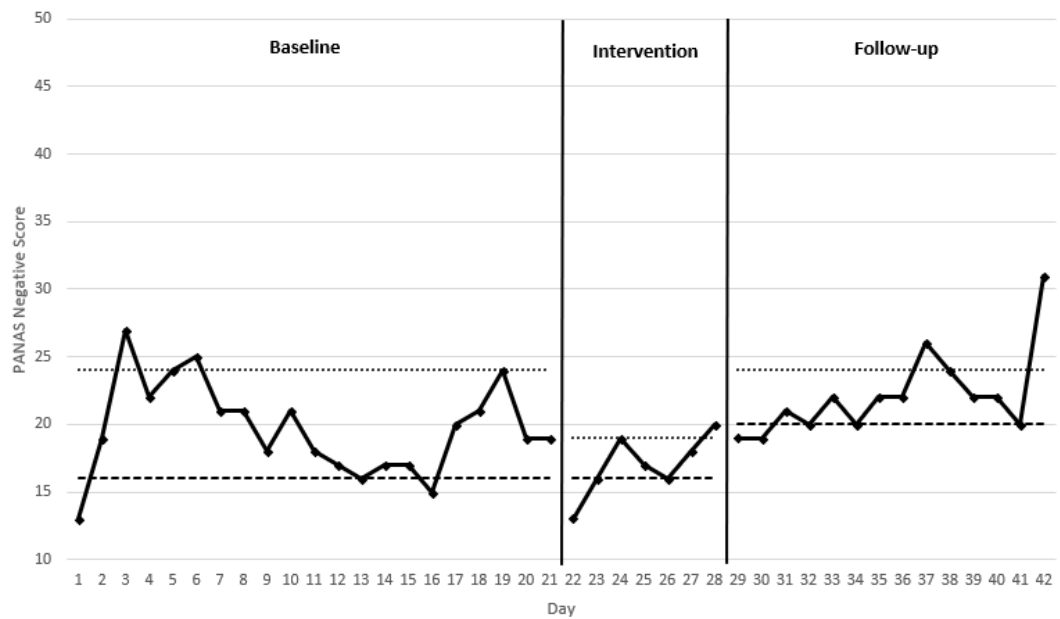


Figure 16. Participant one trimmed range for daily scores on the PANAS negative subscale

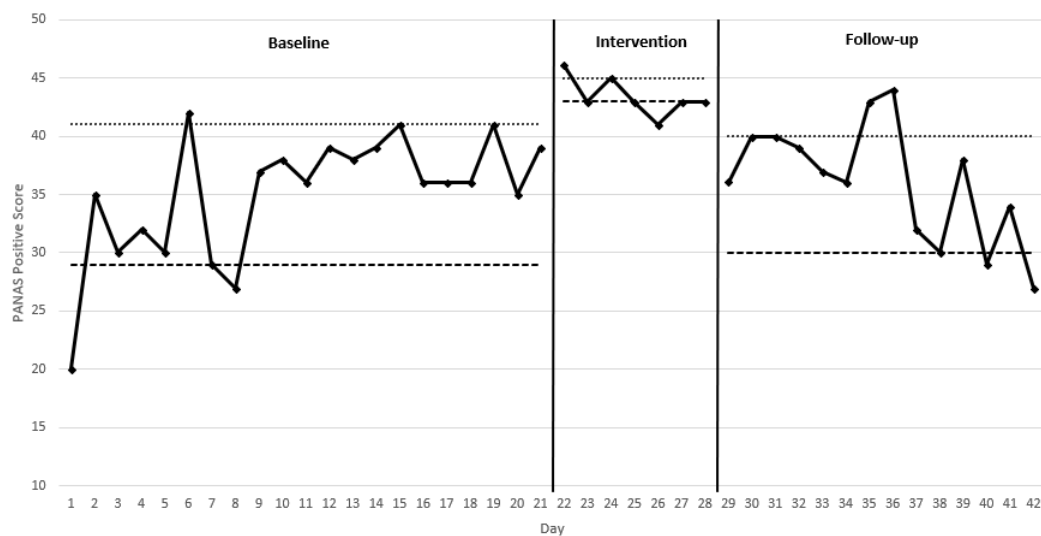


Figure 17. Participant one trimmed range for daily scores on the PANAS positive subscale

Overall, the visual analysis for participant one indicates an association between the imagery intervention and reduced paranoia and negative affect, and improved positive affect, as well as reduced variability scores. It is unlikely that these effects are solely to do with therapist contact, as they experienced face-to-face contact with the researcher at the beginning of the baseline phase and the beginning of the intervention phase. In addition,

participants' scores were significantly improved across the whole of the intervention phase, with no therapist contact on 6 of those days, and significantly reduced again at follow-up with no therapist contact until the last day of the study. Overall, the significant differences between phases indicate that the imagery intervention itself is likely to have had an impact on paranoia and affect.

More recently, there have been improvements in statistical analysis of single-case series data and proponents, such as Morley (2018), recommend utilising robust analyses, i.e., statistics that are appropriate and tested in single-case series research, alongside visual exploration of the data. Therefore, the Mood's Median Test was applied to the data to compare differences in adjacent phases, and the results are outlined in table 10.

Table 10

*Mood's Median Test Comparing Scores Across Phases on the Paranoia Checklist and PANAS Measures for Participant One and Two*

Participant	Measure	Phase Comparison	Mood's Median Test		
			$\chi^2$	df	P
One	PC	Baseline vs Intervention	2.45	1	0.118
		Intervention vs Follow-up	3.88	1	<b>0.049*</b>
	PANAS Negative	Baseline vs Intervention	2.45	1	0.118
		Intervention vs Follow-up	7	1	<b>0.008*</b>
	PANAS Positive	Baseline vs Intervention	7	1	<b>0.008*</b>
		Intervention vs Follow-up	10.07	1	<b>0.002*</b>
Two	PC	Baseline vs Intervention	6.69	1	<b>0.01*</b>
		Intervention vs Follow-up	109.11	1	<b>&lt;.001**</b>
	PANAS Negative	Baseline vs Intervention	5.257	1	<b>0.022*</b>
		Intervention vs Follow-up	9.33	1	<b>0.002*</b>
	PANAS Positive	Baseline vs Intervention	3.16	1	0.075
		Intervention vs Follow-up	12.44	1	<b>&lt;.001**</b>
<b>*<math>p&lt;0.05</math>, **<math>p&lt;0.001</math></b>					

For participant one the results indicate there was a significant difference between intervention and follow-up on the Paranoia Checklist ( $\chi^2 = 3.88$  (1),  $p = 0.008$ ). There was no difference found between baseline and intervention phases ( $\chi^2 = 2.45$  (1),  $p = 0.118$ ). However, visual analysis of the data indicates a possible upwards trend in the baseline on

this measure (Figure 12), which can impact the Mood's Median Test. Therefore, in order to account for potential trends in phases, the Tau-U test was also applied (Table 11).

A positive trend was found on the Paranoia Checklist scores at baseline and when controlled for, there was a significant difference found between baseline and interventions scores ( $Tu = -0.82, z = -3.21, p = 0.001$ ). The Tau-U test allows for comparison of non-adjacent phases, revealing no significant difference between baseline and follow-up phases ( $Tu = -0.14, z = -0.69, p = 0.49$ ). Therefore, the statistics reveal a significant reduction in paranoia between baseline and intervention, and a significant increase in paranoia again between intervention and follow-up.

Results from the Mood's Median Test on PANAS scores revealed a significant difference between intervention and follow-up for the negative affect subscale (Table 10). Uncontrolled Tau-U analysis matched the Mood's Median Test results, with a significant difference found between intervention and follow-up but not for baseline and intervention. In addition, a comparison of baseline and follow-up found a significant positive difference ( $Tu = 0.42, z = 2.09, p = 0.037$ ). Therefore, negative affect showed no difference between baseline and intervention but increased significantly at follow-up.

In contrast, the positive affect subscale of the PANAS demonstrated significant differences across all phases using the Mood's Median Test (see Table 10). However, a positive trend was found at baseline and a negative trend at follow-up (see Table 11). Controlling for the baseline trend using Tau-U revealed a non-significant difference between baseline and intervention phases and between baseline and follow-up. In this case the upwards trend of positive affect scores at baseline may have influenced the differences in broadened median scores observed across these phases. This is in contrast to the visual exploration of the data and evidences the importance of using both analyses to interpret results.

Table 11

*Tau-U Test of Trends in Phases and Comparison Across Phases on the Paranoia Checklist and PANAS for Participant One and Two*

Participant	Measure		Trends			Phase Comparisons					
			Baseline	Intervention	Follow-up	Baseline vs Intervention		Intervention vs Follow-up		Baseline vs Follow-up	
						Uncontrolled	Controlled	Uncontrolled	Controlled	Uncontrolled	Controlled
One	<u>PC</u>	Tau	0.36	0.24	0.16	-0.31	-0.82	0.52	n/a	0.12	-0.14
		Z	2.26	0.75	0.82	-1.22	-3.21	1.9	n/a	0.57	-0.69
		p	<b>0.024*</b>	0.453	0.412	0.222	<b>0.001*</b>	0.057	n/a	0.567	0.49
	<u>PANAS Negative</u>	Tau	-0.19	0.57	0.49	-0.48	n/a	0.91	n/a	0.42	n/a
		Z	-1.21	1.80	2.46	-1.88	n/a	3.32	n/a	2.09	n/a
		p	0.227	0.072	<b>0.014*</b>	0.060	n/a	<b>&lt;.001**</b>	n/a	<b>0.037*</b>	n/a
	<u>PANAS Positive</u>	Tau	0.35	-0.43	-0.43	0.97	0.48	-0.84	n/a	0.09	-0.16
		Z	2.20	-1.35	-2.14	3.79	1.86	-3.06	n/a	0.45	-0.77
		p	<b>0.028*</b>	0.177	<b>0.033*</b>	<b>&lt;.001**</b>	0.063	<b>0.002*</b>	n/a	0.649	0.439
Two	<u>PC</u>	Tau	0.32	0.41	0.43	-0.97	n/a	0.75	n/a	-0.88	n/a
		Z	1.59	1.85	2.3	-0.419	n/a	3.34	n/a	-4.07	n/a
		p	0.112	0.064	<b>0.022*</b>	<b>&lt;.001**</b>	n/a	<b>&lt;.001**</b>	n/a	<b>&lt;.001**</b>	n/a
	<u>PANAS Negative</u>	Tau	-0.08	0.58	-0.17	-0.8	n/a	0.72	0.52	-0.51	n/a
		Z	-0.38	2.61	-0.9	-3.45	n/a	3.2	2.32	-2.37	n/a
		p	0.702	<b>0.009*</b>	0.368	<b>&lt;.001**</b>	n/a	<b>&lt;.001**</b>	<b>0.02*</b>	<b>0.018*</b>	n/a
	<u>PANAS Positive</u>	Tau	-0.49	-0.36	0.08	0.68	0.95	-0.77	n/a	-0.15	0.05
		Z	-2.46	-1.65	0.45	2.96	4.11	-3.44	n/a	-0.71	0.23
		p	<b>0.014*</b>	0.100	0.65	<b>0.003*</b>	<b>&lt;.001**</b>	<b>&lt;.001**</b>	n/a	0.480	0.819

\* $p < 0.05$ , \*\* $p < 0.001$

However, the statistics support a significant reduction in positive affect between intervention and follow-up phases, and no significant difference between baseline and follow-up scores even when controlling for baseline trend (see Table 11). When combined with the reduction in variability in positive affect scores during the intervention phase, the imagery intervention does appear to be associated with positive mood.

The Tau-U statistic offers an interpretable effect size, and for participant one all significant findings were associated with a medium to large effect sizes<sup>5</sup> in the direction expected (see Table 11). Therefore, results for participant one are largely consistent with the findings from visual analysis of the data.

Subjective feedback indicated that he '*felt a bit calmer*' during the intervention phase, although he felt this was due to both the intervention and also possibly due to a change in his medication two weeks into the study. He reported that the imagery intervention was '*quite easy*' and noted a temporary difference in his paranoia and mood for '*a couple of hours*' after completing the intervention. He also stated; '*I felt more relaxed and settled, and felt less paranoid*' during the intervention phase. He rated the guided imagery clip as 8/10 helpful (10 most helpful) and felt that he would '*probably continue using the imagery task every few days, mainly when I feel really bad.*' He also reported '*it might be useful just before I go out,*' which was a time he recognised was associated with increased paranoia.

#### **2.4.8.2 Participant Two.**

Participant two was randomly assigned to a baseline length of two weeks, with a matched follow-up of three weeks. However, she reported that she had continued to use the imagery intervention for five days beyond the seven-day intervention phase, thus reducing the follow-up period to 16 days. She reported that this was for two reasons; she had forgotten to stop the intervention, and she found the intervention helpful. An advantage of single-case research design is the internal control, and so visual and statistical analysis were

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<sup>5</sup> Interpreted using Cohen's (1992) and Sawilowsky's (2009) guidelines.

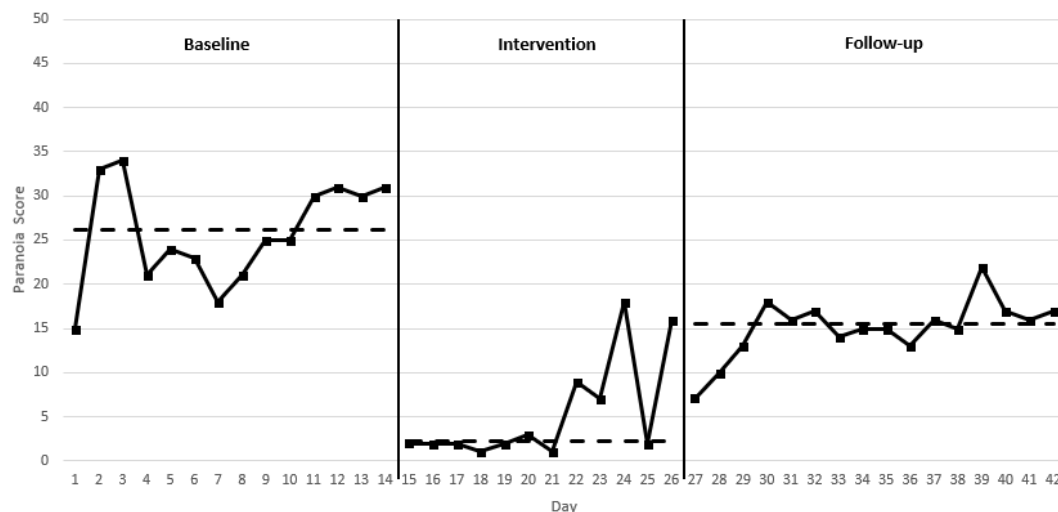
applied to the data using the new intervention length. Trait measure scores for participant two are outlined in table 12 and indicate she has a more avoidant attachment style, relatively stable across time points, and she has high levels of paranoia.

Table 12

*Participant Two Results on Trait Attachment and Paranoia Measures*

Measure	Subscales	Pre	Interpretation	Post	Interpretation
PAM	Anxiety Total	1.5		1.625	
	Avoidance	1.75		1.75	
	Total				
	Difference score	-0.25	Avoidant attachment	-0.125	Avoidant attachment
GPTS	Social Reference	37	Between clinical and non-clinical norms	25	Non-clinical
	Persecution	57	Clinical	46	Between non-clinical and clinical norms

Visual exploration of paranoia scores revealed a large reduction in paranoia between baseline and intervention, with a slight increase in paranoia during follow-up, although this remained well below the baseline scores (Figure 18).



*Figure 18.* Participant two daily scores and broadened median on the Paranoia Checklist



The variability in scores, illustrated using the trimmed range (Figure 19), showed a possible slight increase in variability of paranoia scores during intervention but a significant reduction in variability at follow-up. Participant one shows a consistent and significant reduction in paranoia for the initial seven days of the intervention phase, and the following five days show an increased variability in scores. Participant two reported completing the same intervention at the same time on these days; however, it is possible she was using the intervention in a different way on these days, or perhaps an external factor had influenced this.

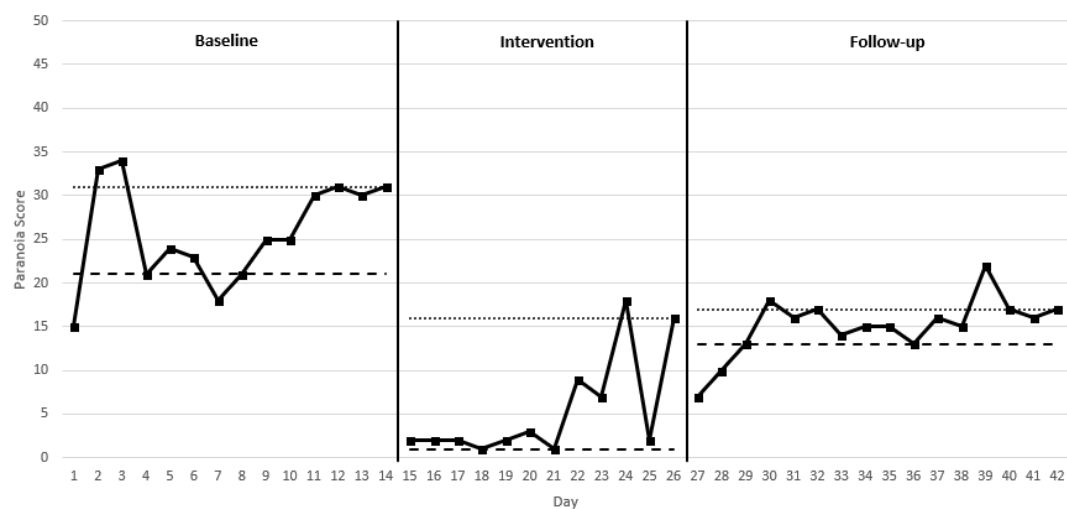


Figure 19. Participant two trimmed range for daily scores on the Paranoia Checklist

Visual analysis of the PANAS subscales demonstrate a significant reduction in negative affect (Figure 20) and increase in positive affect (Figure 21) during the intervention phase, with subsequent changes at follow-up returning closer to baseline scores.

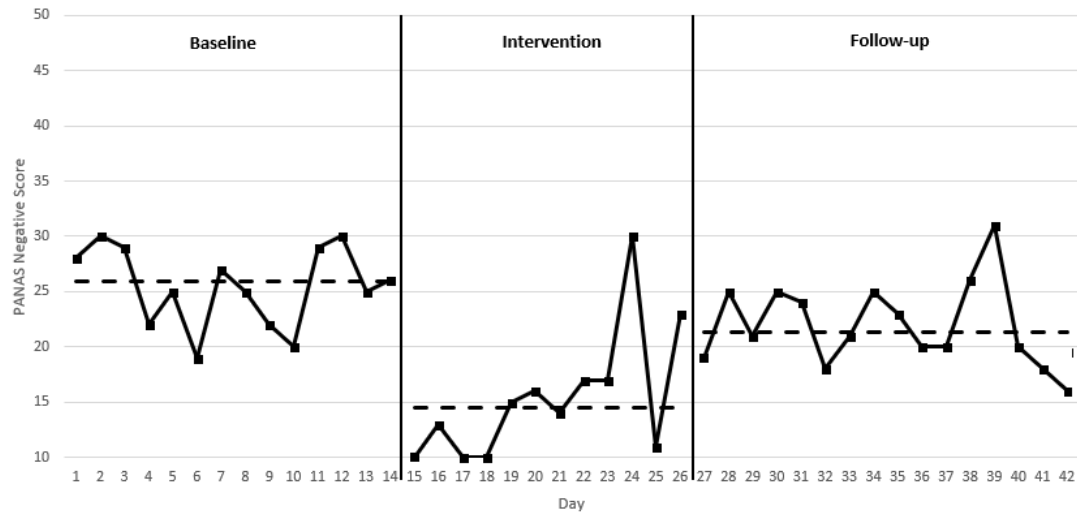


Figure 20. Participant two daily scores and broadened median on the PANAS negative subscale

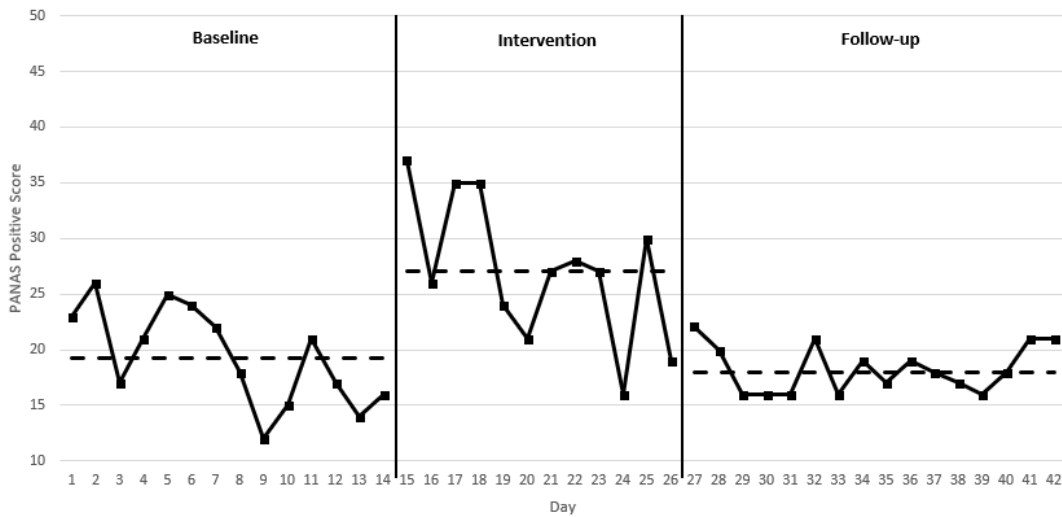


Figure 21. Participant two daily scores and broadened median on the PANAS positive subscale

Further visual exploration demonstrates increased variability in affect scores during the intervention phase (Figures 22 and 23). The trimmed range returns to baseline levels at follow-up for negative affect, but appears slightly reduced at follow-up for positive affect, when compared to baseline.

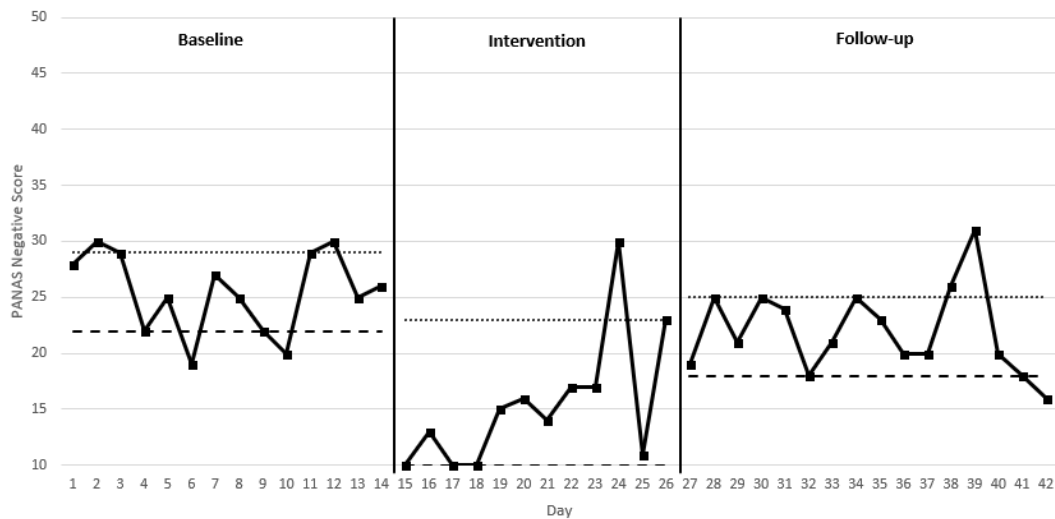


Figure 22. Participant two trimmed range for daily scores on the PANAS negative subscale

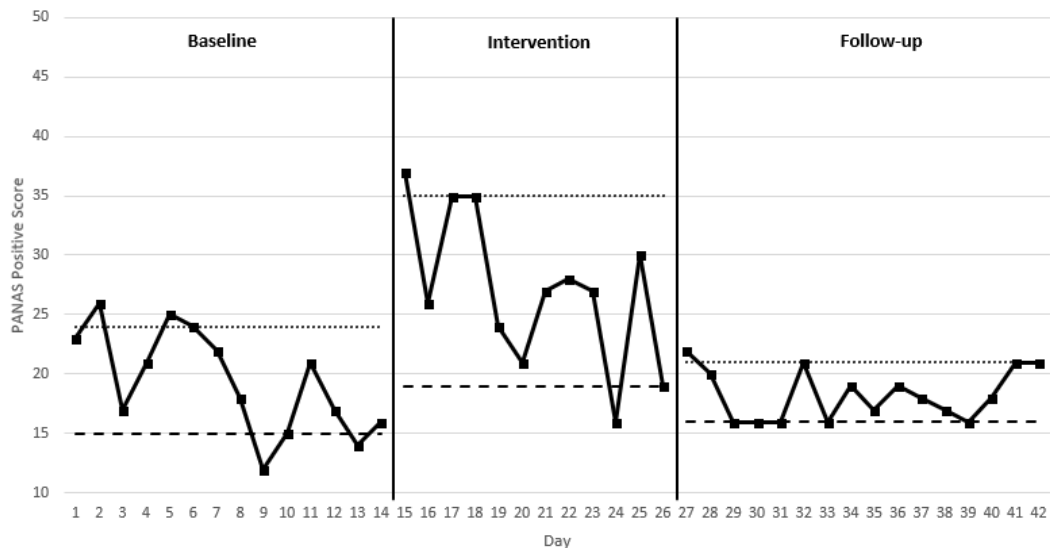


Figure 23. Participant two trimmed range for daily scores on the PANAS positive subscale

Overall, visual analysis of the data for participant two reveals an observable association between reduced paranoia and negative affect, and increased positive affect with the intervention phase, when compared to baseline and follow-up phases. In contrast the variability in scores across all measures appears to increase at intervention.

The Mood's Median Test demonstrated significant differences across all measures and comparable phases (see Table 10) with the exception of the comparison between baseline and intervention for positive affect scores, which was non-significant ( $\chi^2 = 3.16 (1)$ ),

$p = 0.075$ ). However, when controlling for a negative baseline trend on this measure, there was a significant difference found between baseline and intervention phases ( $T_u = 0.95$ ,  $z = 4.11$ ,  $p < 0.001$ ).

Similarly, uncontrolled Tau-U analysis found significant differences between baseline and intervention, and intervention and follow-up on all measures (see Table 11). A positive trend was found in the intervention phase for the PANAS negative subscale ( $T_u = 0.58$ ,  $z = 2.61$ ,  $p = 0.009$ ) and when controlled for using Tau-U, the difference between intervention and follow-up phases remained significant ( $T_u = 0.52$ ,  $z = 2.32$ ,  $p = 0.02$ ).

Tau-U comparison of the baseline and follow-up phases revealed significant differences for paranoia and negative affect (see Table 11). This matches visual findings that the follow-up scores on these measures remained below baseline levels, and indicates a possible on-going impact of the imagery intervention. In contrast, there was no significant difference found between baseline and follow-up scores on the positive affect subscale of the PANAS, even when controlling for the negative baseline trend ( $T_u = 0.05$ ,  $z = 0.23$ ,  $p = 0.819$ ).

Finally, the effect sizes for all significant findings from the Tau-U for participant two were found to be large and in the directions expected (see Table 11).

Overall, the visual and statistical data for participant two indicate a significant reduction in paranoia and negative affect, and a significant increase in positive affect during the intervention phase. Importantly, there may have been on-going effects on paranoia and negative affect beyond the intervention phase, which was not found for positive affect. Increased variability in scores was also seen during the intervention phase, with a subsequent reduction post-intervention.

Subjective feedback indicated that *'the intrusive behaviour of some of my neighbours became less noticeable after completing the imagery task.'* She described finding the imagery intervention *'helped set a pattern for the day'* and *'helped me feel calm and*

*relaxed, but just during the questionnaire completion.*’ She found the intervention *‘relaxing and meditative,’* although *‘not always easy to stay focused, became distracted.’* She felt it was easy to find the time to complete the intervention due to its short duration. She found that the intervention *‘was very helpful’* and rated it as 6/10 helpful. However, she felt *‘the effects did not last long unfortunately. But I am considering doing it again in the future, maybe more than once a day.’*

## **2.5 Discussion**

### **2.5.1 Summary of Findings Study One.**

Study one found a week-long online attachment-based imagery intervention was not feasible in participants from the general population, with very high drop-out rates and variable compliance. The findings were not in line with the hypotheses that the online intervention would be feasible in this population. There was no support found for the hypotheses that completion of a single online secure attachment imagery task would be associated with a reduction in paranoia and distress, and an online insecure attachment imagery task would be associated with increased paranoia and distress.

The results of the pilot study contrast with previous findings of an improvement in paranoia and mood in student populations with both face-to-face (Bullock et al., 2016) and online interventions (Newman-Taylor et al., 2017), although they are consistent with reports from secure-attachment priming in depression and anxiety, where a single prime was not found to improve mood or anxiety (Carnelley et al., 2015). This study did find that repetition of the secure prime over several days did impact on symptoms, suggesting that repetition may improve outcomes.

Current findings do not support the role of insecure attachment and associated working models in the maintenance of sub-clinical paranoia symptoms.

### **2.5.2 Summary of Findings Study Two.**

Study two found support for the hypothesis that secure-attachment imagery is associated with reduced paranoia and negative mood, and increased positive mood for two individuals experiencing clinical symptoms of psychosis. However, quantitative and qualitative evidence from both participants indicated the effects may be temporary. Participants reported finding the intervention accessible and easy to use, and there was no evidence of any adverse effects, in contrast to one previous study which suggested a possible detrimental impact for individuals with an anxious attachment style (Hutton et al., 2017).

The findings are in line with previous research in analogue populations that secure attachment priming reduces paranoia and distress (Bullock et al., 2016; Newman-Taylor et al., 2017). However, this is the first study of secure-attachment imagery in a clinical population and provides initial evidence for the value of further exploration in this group.

There was a suggestion that the reduction in paranoia and negative affect, and the increased positive affect in the intervention phase, transferred into the follow-up phase, particularly for participant two. It's unclear if the effects of the intervention were delayed, or if another factor influenced the results and the inclusion of a longer follow-up period would be useful to examine this. It is possible that the changes in paranoia and affect were more prominent for participant two as she had chosen to continue the intervention phase beyond the planned treatment period. Qualitative feedback from this participant also indicated that additional repetitions of the intervention may be beneficial. In line with attachment theory (Bowlby, 1973), it is feasible that repeated activation of a secure working model will increase the stability of the new representations, which may improve outcomes. However, further data in a larger sample would be required to support this.

### **2.5.3 Strengths, Limitations, and Implications Study One.**

The strengths of study one include its sample, which was taken from the general population and included 42% males, expanding on literature which has focused on young,

female, student populations (Bullock et al., 2016; Newman-Taylor et al., 2017). In addition, the study utilised a high paranoia sample, extending previous examination of secure attachment imagery online (Newman-Taylor et al., 2017), potentially allowing closer comparisons to at-risk and clinical populations. Previous research has been limited by a lack of follow-up measures and the current study benefited from exploring the utility of a seven-day follow-up period. Regardless of a lack of sufficient data for analysis of this follow-up period, as a pilot study it is able to draw important conclusions about the feasibility of the intervention and provide suggestions for improvements to the methodology for future research.

A potential reason for the high drop-out rates is the relatively high burden for participants. There were many questionnaires to complete, some with many items, requiring participants to commit considerable time and effort. Similarly, the results may be affected by participant fatigue in repeating the measures, or potential boredom in completing the same questionnaires every day. Future research would benefit from using fewer and shorter measures where possible, such as the short version of the DASS (Lovibond & Lovibond, 1995). However, rates of attrition provide limited information as to the reasons why individuals did not sustain engagement and a qualitative measure would have been a useful measure of feasibility. Informal feedback from several participants indicated several potential reasons for drop-out, including forgetting to complete the intervention and email prompts being sent to their junk email box. A potential solution would be to use another prompting method. For instance, the online platform used also has a text prompt service, which may be more relevant for modern users who often access the internet via mobile devices, and which would be in line with other studies (e.g. Carnelley et al., 2015).

Study one had several key limitations, including a relatively small sample size precluding analysis for possible confounding variables. Nonetheless, identifying potential confounding variables is also important and these should be considered in futures studies. Similar, to previous research, the current sample was predominantly White-British, reducing

generalisability, and there was no neutral imagery comparison. Thus, future research would benefit from a larger sample size, across a wider age range and more diverse ethnicity, and the inclusion of a neutral control condition.

The study relied on self-report measures, which are subject to potential biases such as the social desirability bias (van de Mortel, 2008). All measures used were standardised and validated; however, we can't assume the accuracy of the ECR avoidance subscale which was not found to be valid in this population.

It could be argued that the online delivery of the intervention diluted any potential active component, especially considering study two found significant effects using a more traditional format. Participants reported holding the image in mind for 44.2% of the time, which can be considered a relatively low proportion. This is likely to be affected by several participants rating the % of time as zero, and may account for the lack of significant effect found. However, it is possible there was some measurement error here, supported by the lack of vividness ratings below two, indicating participants were able to bring an image to mind for at least some of the time. In addition, both conditions were successful in altering felt security in the directions expected. A significant limitation is the use of an indirect measure of intervention compliance, making it unclear if participants did actively engage in the task. The imagery manipulation checks in part counteract this, but further studies should consider alternative measures of compliance, perhaps with more advanced technology.

The pilot study finds no support for working models in attachment theory (Bowlby, 1973). However, the methodological issues described may be implicated. Attachment styles in non-clinical samples may be more stable compared to clinical samples (Sitko et al., 2016), which may result in less effectiveness of priming techniques. However, this idea would need to be explored further.

Whilst no support was found for the use of the online intervention in an analogue sample, it would be too early to reject this format when considering the limitations of the



study and in light of other evidence (Newman-Taylor et al., 2017). Given the potential benefits of online interventions, future research would benefit from addressing some of the methodological issues and in comparing low, high and clinical paranoia samples, with a range of delivery formats.

#### **2.5.4 Strengths, Limitations, and Implications Study Two.**

Study two is the first study exploring secure attachment imagery in individuals with psychosis. It benefits from a robust single-case series design, which provides rich data and allows for close monitoring of both positive and negative changes over time. Notably, this meant the inclusion of individuals who would traditionally be excluded from larger Randomised Control Trials, and thus initial evidence for the effectiveness of the intervention on reducing paranoia and improving affect, has been demonstrated in a complex, more ecologically valid sample.

The use of both visual and statistical analysis of the data is a key strength of this study, which meant we could control for any trends in the baseline data, and reduce the impact of observer bias in interpretation of results. For instance, visual analysis of participant one's daily positive affect scores indicated an increase in positive affect between the baseline and the intervention phases; however, using the Tau-U analysis to control for a positive trend in the baseline, revealed that there was no significant difference between these phases. Similarly, participant one's paranoia scores were observed visually to reduce during the intervention phase when compared to baseline; however, this was only a small reduction and could be subject to different interpretations. The application of statistical procedures revealed a significant difference between these phases, increasing the confidence in the author's visual inspection of the data.

The inclusion of subjective feedback was also useful in supporting quantitative findings. Careful consideration of the design and potential burden on participants (learning from study one) meant that fewer, brief measures were administered and resulted in no

missing data. Finally, the lack of adverse effects found supports the further development and ethical use of this intervention within clinical populations.

There were several limitations in study two, including the potential for a self-selection bias. It is possible that individuals who chose to participate were experiencing less severe symptoms and were more open to imagery interventions. Two other participants declined to complete the study, one of whom reported disliking imagery interventions.

Participant two indicated that she had found the intervention helpful and therefore continued the intervention for longer than the seven days. However, it is possible that an external factor, not measured within the study, impacted on her paranoia during this time period and could have feasibly contributed to her choice in continuing the intervention. The use of additional measures or formal qualitative exploration would be helpful to disentangle this.

Due to the complex nature of psychosis, the participants had a range of symptoms and the present study did not include measures or controls for co-morbid symptoms such as hallucinations, which have been found to be a potential confounding variable (e.g. Sitko et al., 2016). In addition, participant one did experience a change in medication during the study, which may have had an impact on the data collected. However, due to the A-B-A single case methodology, clear effects can be seen with the introduction and removal of the imagery intervention. This design also means that the results aren't generalisable beyond the current two participants.

The suggestion that potential effects of the intervention may be temporary, could point to its application in line with other short-term distress tolerance techniques (Leyro, Zvolensky, & Bernstein, 2011), as an adjunct to other therapies. This may be specifically relevant as current recommended treatments in psychosis and paranoia, such as CBT, are shown to have no advantage over other therapies (Mehl et al., 2015), are associated with limited effectiveness (Jauhar et al., 2014) and are ineffective in relapse prevention (Lynch et

al., 2010). The intervention itself is short and simple to administer and therefore could be utilised by a range of healthcare professionals within a range of settings, including in-patient and out-patient teams.

### **2.5.5 Theoretical Implications**

Study two's experimental design and use of a clinical population, is able to provide a unique contribution to the literature on the association between attachment style and paranoia, which has been largely correlational. The results from the two case studies demonstrate a proposed link between attachment priming and both paranoia and affect.

The results show an association between secure-attachment priming and improved symptoms of paranoia and affect, as well as, greater stability of these symptoms. In combination with the evidence that these changes may be temporary, this has potential implications for our understanding of attachment systems. These findings support the idea that it may be possible to alter attachment representations, whilst also acknowledging that these may be relatively stable and thus require longer interventions to have a long-term impact. Furthermore, there is evidence for a role of imagery in mental representations within the attachment system.

The present study has also found evidence that secure attachment priming may improve affect, in support of the role of attachment processes (i.e., internal working models) and not cognitive processes, as potential mechanism of change. This is in line with suggestions that internal working models differ from core beliefs through the inclusion of affect processes (Berry et al., 2006). However, the present study is not able to draw firm conclusions on such theoretical differences and future studies could disentangle the mechanisms of change through the inclusion of a neutral prime and active control condition, e.g., a relaxation breathing exercise.

The findings from study two are consistent with ideas that attachment security is linked with mental resilience (Rutten et al., 2013). Conceptualised from the perspective of

attachment theory, it is possible that priming a secure attachment activates other positive and secure working models and inhibits negative ones (Bowlby, 1973, 1988a). Activation of a secure representation would then lead to more positive predictions of outcome, positive emotions, and therefore more positive behaviours. For instance, Bentall and Fernyhough (2008) hypothesise that insecure attachment, in combination with experiences of victimisation, increases negative views of the self and this then generates an external attributional style which leads to paranoid thinking. However, it is clear that empirical research is required to explore the specific mechanisms by which priming a secure attachment impacts on paranoia, which is beyond the scope of the current study.

### **2.5.6 Conclusion**

In summary, there has been no support found for the use of a secure-attachment imagery online intervention in a high sub-clinical paranoia population over a one-week period. Similarly, a single administration of this intervention was not found to impact on levels of paranoia or distress. However, it is too early to dismiss the intervention and online format, and future research addressing the issues identified is required.

There is support for the use of a secure attachment imagery intervention in two individuals with clinical levels of paranoia, with no adverse effects found. Potential effects of the imagery intervention may be temporary, or additional repetitions may improve the longevity of outcomes. Research in a larger clinical sample and across a longer time period is required to examine this further. This is the first evidence that attachment-based imagery is associated with reduced paranoia and distress in individuals with psychosis and if found to be effective through further research, it may be a useful intervention which can be employed across settings and by a variety of professionals.

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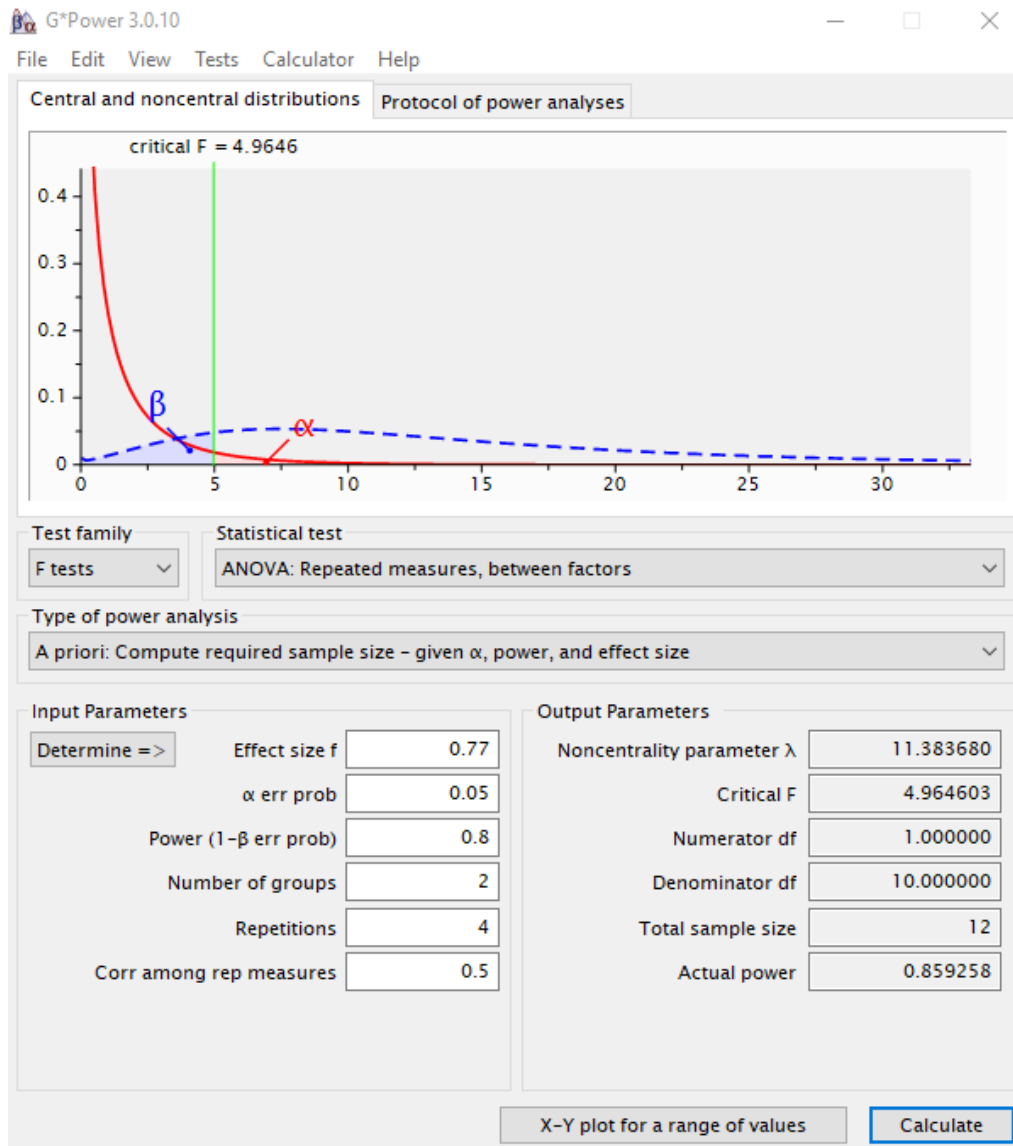
## Appendix A Study Quality Ratings using QualSyst

	Question/objective sufficiently described?	Study design evident and appropriate?	Method of subject/group selection is described and appropriate?	Subject and comparison group characteristics described sufficiently?	If interventional and random allocation possible, was it described?	If interventional and blinding of investigators possible, was it reported?	If interventional and blinding of subjects possible, was it reported?	Outcome measures well defined and robust to measurement bias?	Sample size appropriate?	Analytic methods described/justified and appropriate?	Some estimate of variance is reported for the main results?	Controlled for confounding?	Results reported in sufficient detail?	Conclusions supported by the results?	Summary Score (%)
Hutton, Ellett, & Berry (2017)	2	2	2	2	2	2	0	2	2	1	2	1	2	2	86
Ciocca et al. (2017)	1	2	1	2	-	-	-	2	2	2	2	1	2	1	82
Pearce et al. (2017)	2	2	2	2	-	-	-	2	2	1	2	2	2	2	91
Russo et al. (2017)	2	1	2	2	-	-	-	2	2	2	2	-	2	2	95

Darrell-Berry et al. (2017)	2	2	2	2	-	-	-	2	2	1	2	2	1	1	86
Castilho et al. (2017)	2	2	2	2	-	-	-	2	1	2	1	0	2	2	82
Fett et al. (2016)	2	2	2	2	0	-	2	2	1	2	0	2	2	2	81
Sitko et al. (2016)	2	2	1	2	-	-	-	1	1	1	2	2	2	2	82
Wickham, Sitko, & Bentall (2015)	2	2	1	2	-	-	-	2	2	1	2	2	2	1	86
Korver-Nieberg et al. (2015)	2	2	2	2	-	-	-	1	2	2	1	2	2	2	91
Strand, Goulding, & Tidefors (2014)	2	2	2	2	-	-	-	2	1	2	0	-	2	2	85
Sitko et al. (2014)	2	2	1	2	-	-	-	2	2	1	2	2	1	2	86
Korver-Nieberg et al. (2013)	2	2	2	2	-	-	-	2	2	1	1	2	2	2	91
Ponizovsky et al. (2013)	2	2	1	2	-	-	-	2	2	2	1	0	2	2	86

Berry, Barrowclough, & Wearden (2008)	2	2	2	2	-	-	-	2	2	1	1	2	1	2	<b>86</b>
Pickering, Simpson, & Bentall (2008)	2	1	2	2	-	-	-	1	2	1	1	2	2	2	<b>82</b>
MacBeth, Schwannauer, & Gumley (2008)	2	2	1	2	-	-	-	1	2	2	1	2	2	2	<b>86</b>
Berry et al. (2006)	2	2	1	2	-	-	-	2	2	1	0	2	2	2	<b>82</b>

## Appendix B      G\*Power Output for Estimated Sample Size



## Appendix C      Paranoia Scale

(PS; Fenigstein & Vanable, 1992)

Please indicate to what extent the following statements apply to you, with **1 being not at all applicable to me**, and **5 being extremely applicable to me**.

1. Someone has it in for me
2. I sometimes feel as if I'm being followed
3. I believe that I have often been punished without cause
4. Some people have tried to steal my ideas and take credit for them
5. My friends and family find more fault with me than they should
6. No one really cares that much what happens to you
7. I am sure I get a raw deal from life
8. Most people will use somewhat unfair means to gain profit or an advantage, rather than lose it
9. I often wonder what hidden reason another person may have for doing something nice for you
10. It is safer to trust no one
11. I have often felt that strangers were looking at me critically
12. Most people make friends because friends are likely to be useful to them
13. Someone has been trying to influence my mind
14. I am sure I have been talked about behind my back



15. Most people inwardly dislike putting themselves out to help other people
16. I tend to be on my guard with people who are somewhat more friendly than I expected
17. People have said insulting and unkind things about me
18. People often disappoint me
19. I am bothered by people outside, in cars, in stores, etc. watching me
20. I have often found people jealous of my good ideas just because they had not thought of them first

## Appendix D Experiences in Close Relationships

(ECR; adapted by Carnelly et al., 2015)

The following statements concern how you generally feel in your close relationships. Please indicate the extent to which you agree with each statement by writing the number from the scale on the line provided for each question. *Please remember: we are interested in how you think/feel generally.*

	Disagree Strongly		Neutral/Mixed			Agree Strongly	
	1	2	3	4	5	6	7
_____ 1. I prefer not to show people close to me how I feel deep down.							
_____ 2. I worry about being abandoned.							
_____ 3. I am very comfortable being close to others.							
_____ 4. I worry a lot about my relationships.							
_____ 5. Just when people start to get close to me I feel myself pulling away.							
_____ 6. I worry that people won't care about me as much as I care about them.							
_____ 7. I get uncomfortable when people want to be very close.							
_____ 8. I worry a fair amount about losing my relationships.							
_____ 9. I don't feel comfortable opening up to others.							
_____ 10. I often wish that my loved ones' feelings for me were as strong as my feelings for them.							
_____ 11. I want to get close to others but they keep pulling away.							
_____ 12. I often want to merge completely with others, and this sometimes scares them away.							
_____ 13. I am nervous when others get too close to me.							
_____ 14. I worry about being alone.							
_____ 15. I feel comfortable sharing my thoughts and feelings with those I am close to.							
_____ 16. My desire to be close sometimes scares others away.							
_____ 17. I try to avoid getting too close to others.							
_____ 18. I need a lot of reassurance that I am loved by those close to me.							
_____ 19. I find it relatively easy to get close to others.							
_____ 20. Sometimes I feel that I force others to show more feeling, more commitment.							
_____ 21. I find it difficult to allow myself to depend on others.							
_____ 22. I do not often worry about being abandoned.							
_____ 23. I prefer not to be close to others.							
_____ 24. If I can't get those close to me to show interest in me, I get upset or angry.							
_____ 25. I tell those close to me just about everything.							
_____ 26. I find that others don't want to get as close as I would like.							
_____ 27. I usually discuss my problems and concerns with those close to me.							
_____ 28. When I'm involved in a relationship, I feel somewhat anxious and insecure.							
_____ 29. I feel comfortable depending on others.							
_____ 30. I get frustrated when those I am close to aren't around me as much as I would like.							
_____ 31. I don't mind asking others for comfort, advice, or help.							
_____ 32. I get frustrated when those close to me are not available when I need them.							
_____ 33. It helps to turn to others in times of need.							
_____ 34. When those close to me disapprove of me, I feel really bad about myself.							
_____ 35. I turn to others for many things, including comfort and reassurance.							
_____ 36. I resent it when those I am close to spend time away from me.							

## Appendix E      Depression, Anxiety, Stress Scale

(DASS; Lovibond & Lovibond, 1995)

Depression, Anxiety, Stress Scale (DASS; Lovibond & Lovibond, 1995) – trait mood

<p>Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you <i>over the past week</i>. There are no right or wrong answers. Do not spend too much time on any statement.</p> <p><i>The rating scale is as follows:</i></p> <p>0. Did not apply to me at all</p> <p>1. Applied to me to some degree, or some of the time</p> <p>2. Applied to me to a considerable degree, or a good part of time</p> <p>3. Applied to me very much, or most of the time</p>				
1	I found myself getting upset by quite trivial things	0	1	2 3
2	I was aware of dryness of my mouth	0	1	2 3
3	I couldn't seem to experience any positive feeling at all	0	1	2 3
4	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2 3
5	I just couldn't seem to get going	0	1	2 3
6	I tended to over-react to situations	0	1	2 3
7	I had a feeling of shakiness (eg, legs going to give way)	0	1	2 3
8	I found it difficult to relax	0	1	2 3
9	I found myself in situations that made me so anxious I was most relieved when they ended	0	1	2 3
10	I felt that I had nothing to look forward to	0	1	2 3
11	I found myself getting upset rather easily	0	1	2 3
12	I felt that I was using a lot of nervous energy	0	1	2 3
13	I felt sad and depressed	0	1	2 3
14	I found myself getting impatient when I was delayed in any way (eg, lifts, traffic lights, being kept waiting)	0	1	2 3
15	I had a feeling of faintness	0	1	2 3
16	I felt that I had lost interest in just about everything	0	1	2 3
17	I felt I wasn't worth much as a person	0	1	2 3
18	I felt that I was rather touchy	0	1	2 3
19	I perspired noticeably (eg, hands sweaty) in the absence of high temperatures or physical exertion	0	1	2 3
20	I felt scared without any good reason	0	1	2 3
21	I felt that life wasn't worthwhile	0	1	2 3

*Reminder of rating scale:*

- 0 Did not apply to me at all
- 1 Applied to me to some degree, or some of the time
- 2 Applied to me to a considerable degree, or a good part of time
- 3 Applied to me very much, or most of the time

22	I found it hard to wind down	0	1	2	3
23	I had difficulty in swallowing	0	1	2	3
24	I couldn't seem to get any enjoyment out of the things I did	0	1	2	3
25	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	0	1	2	3
26	I felt down-hearted and blue	0	1	2	3
27	I found that I was very irritable	0	1	2	3
28	I felt I was close to panic	0	1	2	3
29	I found it hard to calm down after something upset me	0	1	2	3
30	I feared that I would be "thrown" by some trivial but unfamiliar task	0	1	2	3
31	I was unable to become enthusiastic about anything	0	1	2	3
32	I found it difficult to tolerate interruptions to what I was doing	0	1	2	3
33	I was in a state of nervous tension	0	1	2	3
34	I felt I was pretty worthless	0	1	2	3
35	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
36	I felt terrified	0	1	2	3
37	I could see nothing in the future to be hopeful about	0	1	2	3
38	I felt that life was meaningless	0	1	2	3
39	I found myself getting agitated	0	1	2	3
40	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
41	I experienced trembling (eg, in the hands)	0	1	2	3
42	I found it difficult to work up the initiative to do things	0	1	2	3

## Appendix F      Adapted Paranoia Checklist

(Lincoln, Lange, Burau, Exner, & Moritz, 2010)

Please read the following statements and rate the extent to which they apply at this moment.

1. I need to be on my guard against others

1	2	3	4	5	
<i>Not at all</i>					<i>Very Strongly</i>

2. There might be negative comments being circulated about me

1	2	3	4	5	
<i>Not at all</i>					<i>Very Strongly</i>

3. People deliberately try to irritate me

1	2	3	4	5	
<i>Not at all</i>					<i>Very Strongly</i>

4. I might be being observed or followed

1	2	3	4	5	
<i>Not at all</i>					<i>Very Strongly</i>

5. People are trying to make me upset

1	2	3	4	5	
<i>Not at all</i>					<i>Very Strongly</i>

6. People communicate about me in subtle ways

1	2	3	4	5	
<i>Not at all</i>					<i>Very Strongly</i>

7. Strangers and friends look at me critically

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

8. People might be hostile towards me

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

9. Bad things are being said about me behind my back

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

10. Someone I know has bad intentions towards me

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

11. I have a suspicion that someone has it in for me

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

12. People would harm me if given an opportunity

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

13. Someone I don't know has bad intentions towards me

1                      2                      3                      4                      5

*Not at all*

*Very Strongly*

14. There is a possibility of a conspiracy against me

1            2            3            4            5

*Not at all*

*Very Strongly*

15. People are laughing at me

1            2            3            4            5

*Not at all*

*Very Strongly*

16. I am under threat from others

1            2            3            4            5

*Not at all*

*Very Strongly*

17. I can detect coded messages about me in the press/TV/radio

1            2            3            4            5

*Not at all*

*Very Strongly*

18. My actions and thoughts might be controlled by others

1            2            3            4            5

*Not at all*

*Very Strongly*

## Appendix G      Positive and Negative Affect Scale

(PANAS; Watson, Clark, & Tellegen, 1988)

This scale consists of a number of words that describe different feelings and emotions. Read each item and then list the number from the scale below next to each word. **Indicate to what extent you feel this way right now, that is, at the present moment.**

1	2	3	4	5
Very Slightly or Not at All	A Little	Moderately	Quite a Bit	Extremely

_____ 1. Interested	_____ 11. Irritable
_____ 2. Distressed	_____ 12. Alert
_____ 3. Excited	_____ 13. Ashamed
_____ 4. Upset	_____ 14. Inspired
_____ 5. Strong	_____ 15. Nervous
_____ 6. Guilty	_____ 16. Determined
_____ 7. Scared	_____ 17. Attentive
_____ 8. Hostile	_____ 18. Jittery
_____ 9. Enthusiastic	_____ 19. Active
_____ 10. Proud	_____ 20. Afraid



## Appendix H      Secure Attachment-Based Imagery Script (Study One)

Thank you for taking part in this study. Please only proceed if you are able to spend the next few minutes alone in a quiet place, focusing on this task.

I'd like you to think of a time when you have been with other people – you may have been with just one other person or with a group; perhaps a family member or a friend or friends – when you felt safe, relaxed and secure, and you felt that you could trust the people you were with.

As best you can, focus on this memory, on how safe and secure you felt and how you trusted the other person or people.

When we feel safe and secure with other people, and confident that we can trust them, we often feel good about ourselves and may have an image or a sense of ourselves in mind. As best you can, picture yourself in this situation.

Now you have identified a situation when you felt safe and secure, please *close your eyes and re-create the situation, and the image you have of yourself*, as clearly vividly as possible in your mind's eye.

Notice what you are doing.

Notice who you are with.

Notice what you can see and hear.

Notice what the other person or people are doing.

Notice how you look like – if someone else was looking at you, and had to describe you, notice what they would see.

You have now gathered more details about this time when you felt safe and secure, please *continue to close your eyes and hold the situation, and the image you have of yourself*, as clearly as possible in your mind's eye.

As best you can, notice how clear and vivid this image is in your mind's eye

Focusing on this image, notice any sensations in your body.

Focusing on this image, notice any emotions that emerge as you hold this image in mind.

Focusing on this image, notice the sense of being safe and secure.

Now you have gathered these additional details about this time when you felt safe and secure, please *continue to close your eyes, holding the situation, and the image you have of yourself*, as clearly as possible in your mind's eye for about one minute before moving onto the next set of questions.

## **Appendix I      Insecure Attachment-Based Imagery**

### **Script (Study One)**

Thank you for taking part in this study. Please only proceed if you are able to spend the next few minutes alone in a quiet place, focusing on this task.

I'd like you to think of a time when you have been with other people – you may have been with just one other person or with a group; perhaps a family member or a friend or friends; or it might be with people you don't know or don't know well – when you felt wary or suspicious, that you could not trust the people you were with, or that someone was out to get you in some way.

As best you can, focus on this memory, on how wary and suspicious you felt, and that they could not be trusted.

When we feel wary or suspicious of other people, and that they cannot be trusted, we often feel bad about ourselves and may have an image or a sense of ourselves in mind. As best you can, picture yourself in this situation.

Now you have identified a situation when you felt wary and suspicious, please close your eyes and re-create the situation, and the image you have of yourself, as clearly vividly as possible in your mind's eye.

Notice what you are doing.

Notice who you are with.

Notice what you can see and hear.

Notice what the other person or people are doing.

Notice how you look like – if someone else was looking at you, and had to describe you, notice what they would see.

You have now gathered more details about this time when you felt wary and suspicious, please continue to close your eyes and hold the situation, and the image you have of yourself, as clearly as possible in your mind's eye.

As best you can, notice how clear and vivid this image is in your mind's eye

Focusing on this image, notice any sensations in your body.

Focusing on this image, notice any emotions that emerge as you hold this image in mind.

Focusing on this image, notice the sense of being wary and suspicious.

Now you have gathered these additional details about this time when you felt wary and suspicious, please continue to close your eyes, holding the situation, and the image you have of yourself, as clearly as possible in your mind's eye for about one minute before moving onto the next set of questions.

## Appendix J      Screenshots from Online Intervention

1. Sign-in webpage for participants.

The screenshot shows a web interface for 'Psychology Research' with the subtitle 'Effect of imagery on cognition'. The header is dark teal with white text. Below the header is a 'Welcome' section. The main content area is divided into two columns: 'New Users' and 'Registered Users'. The 'New Users' column contains a thank-you message, study details, and a 'Continue' button. The 'Registered Users' column contains a message about email/text messages and a 'Login' button.

**Psychology Research**      Effect of imagery on cognition

**Welcome**

**New Users**

Thank you for showing an interest in our study.

For full details of the study and how to participate click continue.

[Continue](#)

**Registered Users**

If you have been directed here by an email or text message please log in to continue

[Login](#)

## 2. Consent statement

### What happens if I change my mind?

You have the right to withdraw at any time, without penalty.

### What will happen to the results of the research?

The data collected from this study will be analysed and written up as part of my third-year project. Participants can contact the researchers and request a copy of the results. A summary of this research project will be supplied upon request. If you would like a project summary, please contact me at [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk).

### Where can I get more information?

If you require more information about the project, please feel free to contact me at [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk).

### 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, SO17 1BJ.  
Phone: +44 (0)23 8059 3856, email [Rgoinfo@soton.ac.uk](mailto:Rgoinfo@soton.ac.uk)

If you have any concerns about any distressing feelings aroused by this study, please contact me ( [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk) ) or your GP for further advice. University of Southampton students may also wish to talk to Nightline (Web: <http://nline.susu.org/>, telephone: 02380 595236), Peer Support (Web: <https://www.susu.org/help-and-support/peer-support/2013/>) or the University of Southampton Counselling Services ([counser@soton.ac.uk](mailto:counser@soton.ac.uk), telephone: 02380 593719). All participants can contact Samaritans ( <https://www.samaritans.org/> / tel: +44 116123).

Thank you for taking the time to read this information and considering taking part in our research.

### Statement of Consent

I have read and understood the information about this study.  
In consenting, I understand that personal information will not be released to or viewed by anyone other than researchers involved in this project. Results of this study will not include your name or any other identifying characteristics.  
Completion of this questionnaire will be taken as evidence of you giving informed consent to be included as a participant in this study, for your data to be used for the purposes of research, and that you understand that published results of this research project will maintain your confidentiality. Your participation is voluntary and you may withdraw your participation at any time. If you choose not to participate there will be no consequences to your grade or to your treatment as a student in the psychology department.

☐

Yes

☐

No

Continue

### 3. Example screenshots of questionnaires from online intervention

Psychology  
Research

Effect of imagery on cognition

Questionnaire

Please read the following statements and rate the extent to which they apply **at this moment**.

	1 Not at all	2	3	4	5 Very Strongly
1. I need to be on my guard against others	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. There might be negative comments being circulated about me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. People deliberately try to irritate me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. I might be being observed or followed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. People are trying to make me upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. People communicate about me in subtle ways	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Strangers and friends look at me critically	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Psychology  
Research

Effect of imagery on cognition

Questionnaire

This scale consists of a number of words that describe different feelings and emotions. **Indicate to what extent you feel this way right now, that is, at the present moment by ticking in the appropriate box.**

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
1. Interested	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Distressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Excited	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. Strong	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. Guilty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. Scared	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

	Very slightly or not at all	A little	Moderately	Quite a bit	Extremely
--	-----------------------------	----------	------------	-------------	-----------

#### 4. Audio clip

### Psychology Research

#### Effect of imagery on cognition

To play the audio file, please press play. You may need to turn your volume on. When you have finished, please click the continue button to the next page.



Audio file not working? Email [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk)

It is really important that you listen to the full audio clip in order that this research is useful to the people we hope will benefit from the results. When you have finished listening to the audio clip, please click continue

Continue

#### 5. Example of imagery manipulation check

### Psychology Research

#### Effect of imagery on cognition

#### Questionnaire

##### Imagery check

Please give the percentage of time that the image was held in mind from 0% (none of the time) to 100% (all of the time)



0% (none of the time)

100% (all of the time)

Please rank the vividness of the image between 0 (not at all vivid) and 10 (extremely vivid)



## **Appendix K      Participant Information Sheet (Study One)**

### **The Impact of Imagery on Mood Participant Information Sheet (version 4, 15/06/2018)**

**Study Title:** The impact of imagery on mood

**Researchers:** Cathryn Pitfield

**ERGO number:** 30332

**Please read this information carefully before deciding whether to take part in this research. If you are happy to participate you will be asked to give consent.**

#### **What is the research about?**

My name is Cathryn Pitfield and I am a third-year doctoral student at the University of Southampton. I am requesting your participation in one or two linked studies on the effects of an imagery task.

#### **Why have I been chosen?**

You have been invited to participate to gain course credits or for the chance to win a £40 amazon voucher, and contribute to existing research.

#### **What will happen to me if I take part?**

Each study will involve completing an online screen, then if eligible, completing various questionnaires and a brief imagery task. You will then listen to the brief imagery recording each day for six days and complete a final set of questionnaires. Each study will take approximately 102 minutes in total. You will need to complete the study in a quiet environment with no distractions. It is important that you only complete one study at a time.

#### **Are there any benefits in my taking part?**

If you are a psychology student at the University of Southampton, you will be rewarded with course credits. You will receive 1 credit for the screening questionnaire and a further **14 credits** for each of the full studies completed. Your data will also aid research into this area. Alternatively, you can opt-in for the chance to win a £40 amazon voucher. The winner will be selected at random after the end of the study period.

#### **Are there any risks involved?**

Some questions may be of a sensitive nature. Some tasks may cause brief discomfort. You may withdraw at any time, without penalty.

#### **Will my participation be confidential?**

Personal information will not be released to or viewed by anyone other than the researchers involved in this project. Results of this study will not include your name or



any other identifying characteristics. In compliance with the Data Protection Act, all data will be stored on a password protected computer to maintain confidentiality.

**What should I do if I want to take part?**

Completion of the questionnaires will be taken as evidence of your giving informed consent to be included as a participant in one or two of the linked studies, for your data to be used for the purposes of research, and that you understand that published results of this research project will maintain your confidentiality. Your participation is voluntary and you may withdraw your participation at any time. If you choose not to participate there will be no consequences to your grade or to your treatment as a student in the psychology department.

**NOTE:** Please only take part in one of these two linked studies at one time.

**What happens if I change my mind?**

You have the right to withdraw at any time, without penalty.

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

The data collected from this study will be analysed and written up as part of my third-year project. Participants can contact the researchers and request a copy of the results. A summary of this research project will be supplied upon request. If you would like a project summary, please contact me at [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk).

**Where can I get more information?**

If you require more information about the project, please feel free to contact me on: [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk).

**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, SO17 1BJ. Phone: +44 (0)23 8059 3856, [Rgoinfo@soton.ac.uk](mailto:Rgoinfo@soton.ac.uk)

If you have any concerns about any distressing feelings aroused by this study, please contact me at: [cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk)) or your GP for further advice. **University of Southampton students may also** wish to talk to Nightline (Web: <http://nline.susu.org/>, telephone: 02380 595236), Peer Support (Web: <https://www.susu.org/help-and-support/peer-support/2013/>) or the University of Southampton Counselling Services ([counser@soton.ac.uk](mailto:counser@soton.ac.uk), telephone: 02380 593719). **All participants can contact Samaritans** (<https://www.samaritans.org/> tel: +44 116123).

Thank you for taking the time to read this information and considering taking part in our research.

## **Appendix L      Debrief Form (Study One)**

### **The Impact of Imagery on Mood Debriefing Statement (version 4, 15/06/2018)**

Thank you for completing this online project (Ethics ID: 30332)

The present study aims to determine the impact of attachment-based imagery on non-clinical paranoia, mood and self-esteem. The maintenance of anxiety-based issues have been linked to mental imagery (Hirsch & Holmes, 2007). Studies have shown imagery is also linked to self-esteem (Gilbert & Irons, 2004) and paranoia (Freeman, 2007). Insecure attachment predicts major depression and anxiety (Bifulco et al., 2006) and attachment anxiety is associated with negative self-imagery and negative affect (Brennan, Clarke, & Shaver, 1998). This study will examine the impact of insecure and secure attachment-based imagery tasks on non-clinical paranoia and mood. We hypothesise that secure attachment imagery will increase mood and self-esteem, and reduce non-clinical paranoia, and that insecure attachment imagery will have the opposite effect.

There were two experimental conditions. If asked to recall a situation in which you felt safe and secure with another person, you were allocated to the secure condition. If asked to recall a situation in which you felt unsafe or distrusting with another person, you were allocated to the insecure condition

Results of this study will not include your name or any other identifying characteristics. The experiment did not use deception. You may have a copy of this summary if you wish. You may also request a summary of the complete research findings. To do this, please contact me:  
[cp19g15@soton.ac.uk](mailto:cp19g15@soton.ac.uk).

Thank you for your participation in this research.

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, SO17 1BJ. Phone: +44 (0)23 8059 3856, email [Rgoinfo@soton.ac.uk](mailto:Rgoinfo@soton.ac.uk)

If you have any concerns or experience any ongoing discomfort or distress following these studies, please contact me ([cp19q15@soton.ac.uk](mailto:cp19q15@soton.ac.uk)), my supervisor ([knt@soton.ac.uk](mailto:knt@soton.ac.uk)) or your GP for further advice. University of Southampton students may also wish to talk to Nightline (<http://nline.susu.org/>, tel: 02380 595236), Peer Support (<https://www.susu.org/help-and-support/peer-support/2013/>) or the University of Southampton Counselling Services ([counser@soton.ac.uk](mailto:counser@soton.ac.uk), tel: 02380 593719). All participants can contact Samaritans (<https://www.samaritans.org/> tel: +44 116 123).

If you are interested in finding out more about this area of research, the following may be useful to you:

Smith, B., Fowler, G. D. & Freeman, D. (2006). Emotion and psychosis: Links between depression, self-esteem, negative schematic beliefs and delusions and hallucinations. *Schizophrenia Research*, 86 (1-3), 181-188.

Freeman, D. (2007). Suspicious minds: The psychology of persecutory delusions. *Clinical Psychology Review*, 27(4), 425-457.

## Appendix M SPSS Outputs for Two-Way Mixed ANOVAs

1) Mixed ANOVA output for Paranoia Checklist across conditions.

### Tests of Within-Subjects Effects

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Time	Sphericity Assumed	183.868	1	183.868	1.853	.203	.156	1.853	.234
	Greenhouse-Geisser	183.868	1.000	183.868	1.853	.203	.156	1.853	.234
	Huynh-Feldt	183.868	1.000	183.868	1.853	.203	.156	1.853	.234
	Lower-bound	183.868	1.000	183.868	1.853	.203	.156	1.853	.234
Time * Group	Sphericity Assumed	46.201	1	46.201	.466	.511	.044	.466	.095
	Greenhouse-Geisser	46.201	1.000	46.201	.466	.511	.044	.466	.095
	Huynh-Feldt	46.201	1.000	46.201	.466	.511	.044	.466	.095
	Lower-bound	46.201	1.000	46.201	.466	.511	.044	.466	.095
Error(Time)	Sphericity Assumed	992.257	10	99.226					
	Greenhouse-Geisser	992.257	10.000	99.226					
	Huynh-Feldt	992.257	10.000	99.226					
	Lower-bound	992.257	10.000	99.226					

a. Computed using alpha = .05

### Levene's Test of Equality of Error Variances<sup>a</sup>

	F	df1	df2	Sig.
PCatotal	1.579	1	10	.237
PCbtotal	.269	1	10	.615

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Group

Within Subjects Design: Time

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent . Parameter	Observed Power <sup>a</sup>
Intercept	26420.858	1	26420.858	16.6315	.000	.943	166.315	1.000
Group	.525	1	.525	.03	.955	.000	.003	.050
Error	1588.600	10	158.860					

a. Computed using alpha = .05

2) Mixed ANOVA output for negative affect subscale of the PANAS across conditions.

### Tests of Within-Subjects Effects

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Time	Sphericity Assumed	1.458	1	1.458	.178	.682	.017	.178	.067
	Greenhouse- Geisser	1.458	1.000	1.458	.178	.682	.017	.178	.067
	Huynh-Feldt	1.458	1.000	1.458	.178	.682	.017	.178	.067
	Lower-bound	1.458	1.000	1.458	.178	.682	.017	.178	.067
Time * Group	Sphericity Assumed	1.458	1	1.458	.178	.682	.017	.178	.067
	Greenhouse- Geisser	1.458	1.000	1.458	.178	.682	.017	.178	.067
	Huynh-Feldt	1.458	1.000	1.458	.178	.682	.017	.178	.067
	Lower-bound	1.458	1.000	1.458	.178	.682	.017	.178	.067
Error(Time)	Sphericity Assumed	82.000	10	8.200					
	Greenhouse- Geisser	82.000	10.000	8.200					
	Huynh-Feldt	82.000	10.000	8.200					
	Lower-bound	82.000	10.000	8.200					

a. Computed using alpha = .05

### Levene's Test of Equality of Error Variances<sup>a</sup>

	F	df1	df2	Sig.
PAN	1	1	1	.
ASaneg	.418		0	261
PAN	.	1	1	.
ASbneg	.971		0	348

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Group

Within Subjects Design: Time

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared	Noncent. Parameter	Observed Power <sup>a</sup>
Intercept	6568.811	1	6568.811	101.478	.000	.910	101.478	1.000
Group	7.811	1	7.811	.121	.736	.012	.121	.061
Error	647.314	10	64.731					

a. Computed using alpha = .05

3) Mixed ANOVA output for positive affect subscale of the PANAS across conditions.

### Tests of Within-Subjects Effects

Measure: MEASURE\_1

Source		Type III Sum of Squares	df	Mean Square	F	Sig.
time	Sphericity Assumed	5.833	1	5.833	.213	.654
	Greenhouse-Geisser	5.833	1.000	5.833	.213	.654
	Huynh-Feldt	5.833	1.000	5.833	.213	.654
	Lower-bound	5.833	1.000	5.833	.213	.654
time * Group	Sphericity Assumed	.000	1	.000	.000	1.000
	Greenhouse-Geisser	.000	1.000	.000	.000	1.000
	Huynh-Feldt	.000	1.000	.000	.000	1.000
	Lower-bound	.000	1.000	.000	.000	1.000
Error(time)	Sphericity Assumed	274.000	10	27.400		
	Greenhouse-Geisser	274.000	10.000	27.400		
	Huynh-Feldt	274.000	10.000	27.400		
	Lower-bound	274.000	10.000	27.400		



### Levene's Test of Equality of Error Variances<sup>a</sup>

	F	df1	df2	Sig.
PANASapos	.371	1	10	.556
PANASbpos	3.432	1	10	.094

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Group

Within Subjects Design: time

### Tests of Between-Subjects Effects

Measure: MEASURE\_1

Transformed Variable: Average

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Intercept	13664.933	1	13664.933	145.310	.000
Group	39.433	1	39.433	.419	.532
Error	940.400	10	94.040		

## Appendix N SPSS Correlation Matrix for Trait Measures (Study One)

		Correlations					
		PC_a	PC_b	PANASneg_a	PANASpos_a	PANASneg_b	PANASpos_b
PC_a	Pearson Correlation	1	.280	.879**	.566	.636*	.034
	Sig. (2-tailed)		.377	.000	.055	.026	.915
	N	12	12	12	12	12	12
PC_b	Pearson Correlation	.280	1	.269	.330	.685*	.124
	Sig. (2-tailed)	.377		.399	.295	.014	.700
	N	12	12	12	12	12	12
PANASneg_a	Pearson Correlation	.879**	.269	1	.441	.782**	-.115
	Sig. (2-tailed)	.000	.399		.151	.003	.721
	N	12	12	12	12	12	12
PANASpos_a	Pearson Correlation	.566	.330	.441	1	.394	.565
	Sig. (2-tailed)	.055	.295	.151		.206	.056
	N	12	12	12	12	12	12
PANASneg_b	Pearson Correlation	.636*	.685*	.782**	.394	1	-.104
	Sig. (2-tailed)	.026	.014	.003	.206		.748
	N	12	12	12	12	12	12
PANASpos_b	Pearson Correlation	.034	.124	-.115	.565	-.104	1
	Sig. (2-tailed)	.915	.700	.721	.056	.748	
	N	12	12	12	12	12	12

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

*Note.* PC (Paranoia Checklist), PANASneg (Negative affect subscale from PANAS), PANASpos (Positive affect subscale from PANAS), a (pre-intervention), b (post-intervention).

## Appendix O Participant Information Sheet (Study Two)

### Participant Information Sheet

**Study Title:** The impact of repeated Imagery practice on mood and wellbeing

**Researcher:** Cathryn Pitfield, Trainee Clinical Psychologist

**Research Supervisors:** Dr Katherine Newman-Taylor and Dr Tess Maguire

**ERGO number:** 27474

*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?**

I am a Trainee Clinical Psychologist studying at the University of Southampton and as part of my training I am conducting research into the role of imagery in supporting individuals with symptoms of psychosis.

#### **Why have I been asked to participate?**

You have been invited to take part in this study as you struggle with paranoia/worries about other people and are currently receiving support from a Community Mental Health Team (CMHT) or Early Intervention in Psychosis team (EIP). The study is only open to individuals aged between 18 and 65 who have capacity to consent and have an allocated care coordinator.

#### **What will happen to me if I take part?**

You will be asked to meet with the researcher in person to discuss the study and what is involved. You will be asked to complete several questionnaires, which include questions on demographic information and clinical information relating to your diagnosis. At this initial meeting you will also be provided a booklet of short questionnaires to be completed on a daily basis over a total of 6 weeks. At a randomly allocated time during these 6 weeks you will be asked to meet with the researcher to participate in an imagery exercise involving thinking back to a past positive memory. This session will last approximately 1 hour. The researcher will use their own voice to record an audio clip describing your imagery, which you will be asked to listen to at home once every day for 6 days following this meeting. The daily practice should last no more than 10 minutes. Following 6 days of practice, you will be asked to continue completing the daily questionnaires until the end of the 6 week study period. You will meet with the researcher face to face when you will hand in your booklet and receive debrief from the study. This session should last approximately 30 minutes only.

#### **Are there any benefits in my taking part?**

Many people find imagery tasks and completing self-assessments enjoyable. If you choose to participate in the study, you will have the opportunity to develop skills in the use of imagery, which may support and promote your psychological well-being. In order to compensate you for your time, you will also receive £10 for attendance of each face-to-face session. In addition, by participating in the study you will be contributing to research and development of interventions for individuals with similar difficulties, which may indirectly impact you or others you know in the future.

#### **Are there any risks involved?**

On occasion, some imagery techniques can activate feelings of sadness or loss from the past; however, it is believed that the risk of this will be low in the use of a positive imagery intervention.

#### **Will my participation be confidential?**

Data collected as a result of this study will be kept anonymous, i.e. will not include any personal identifiable information. Your data will be stored securely on a password protected computer and only accessed by the principal researcher and the research supervisors. Personal-identifiable data will

be kept for 6-12 months following the end of the study and then destroyed. Anonymous research data collected will be stored for up to 15 years, in accordance with the relevant ethics approval. You will not be identified by name in any publications that may arise from the study. The individualised audio clip will not include any personal identifiable information and will only include the researcher's voice. You will receive a copy of this audio clip and following the study you may choose to keep this for yourself or for this to be destroyed. All copies of the audio file kept by the researcher will be destroyed following the end of the study.

If you decide to take part in this study, we will inform your GP and care co-ordinator. However, should the researcher become concerned about your own or other's safety than they are duty bound to follow NHS confidentiality procedures and inform the relevant agencies/individuals of any potential risk. The aim of this will be to ensure the safety of everyone involved.

**What should I do if I want to take part?**

If you would like to take part in the study please inform your care coordinator or email the researcher directly on [cp19q15@soton.ac.uk](mailto:cp19q15@soton.ac.uk).

**What happens if I change my mind?**

You have the right to withdraw at any time and this will not affect your access to current or any future support and treatment from your care team. If you agree to participate you will be asked to sign a consent form and we encourage you to take time to consider whether you wish to participate. After signing, you still retain the right to withdraw from the study at any time, without giving a reason and without this having any negative consequences to you. Any data already collected at point of withdrawal will be retained for use within the study and will remain anonymous.

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

Unfortunately, due to the need to keep data anonymous, we will not be able to provide individual results from the study, including the outcomes from completed questionnaires. However, should you wish to receive information on the overall findings from the study, please provide the researcher with your email address and they will contact you upon completion. Please be aware that this could be up to 18 months following your participation in the study. The researcher can also provide relevant references should you wish to read more information about aspects of this research. You will have the imagery guidance to keep, if this has proved useful to you.

**Where can I get more information?**

If you have any questions following reading this information sheet please contact the researcher via email: [cp19q15@soton.ac.uk](mailto:cp19q15@soton.ac.uk).

**What happens if something goes wrong?**

*If you have questions about your rights as a participant in this research, or you have a concern or complaint please contact Southampton University's Research Integrity and Governance Manager (023 8059 5058, [rqoinfo@soton.ac.uk](mailto:rqoinfo@soton.ac.uk)). Alternatively, you may contact the Chair of the Ethics Committee, Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: +44 (0)2380 593856 2, email [fshs-rso@soton.ac.uk](mailto:fshs-rso@soton.ac.uk).*

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

*For confidential advice, support and information, such as details of the NHS complaints procedure, you can contact Southern Health's Customer Experience Team (023 8087 4065, [hp-tr.customereperience@nhs.net](mailto:hp-tr.customereperience@nhs.net), Customer Experience Team FREEPOST RSJL-JXSX-ATUE 5 Sterne Road Tatchbury Mount, Calmore Southampton Hampshire SO40 2RZ).*

**Thank you.**

Thank the individual for taking the time to read the information sheet and considering taking part in the research

## Appendix P Participant Consent Form (Study Two)



### CONSENT FORM

**Study title:** The impact of repeated Imagery practice on mood and wellbeing

**Researcher name:** Cathryn Pitfield, Trainee Clinical Psychologist

**Research Supervisors:** Dr Katherine Newman-Taylor and Dr Tess Maguire

**ERGO number:** 27474

**Please initial the box(es) if you agree with the statement(s):**

I have read and understood the information sheet (29/11/2017, Version 3) and have had the opportunity to ask questions about the study.	
I agree to take part in this research project and agree for my data to be used for the purpose of this study.	
I understand my participation is voluntary and I may withdraw at any time for any reason without my care or rights being affected.	
I understand that my data collected will be treated confidentially and that any published results from this study will also retain my confidentiality	
I agree that the researcher can use anonymous quotes from my feedback when reporting the study	
I agree for my Care Co-Ordinator and GP to be informed of my participation in this study. I understand that if the researcher becomes concerned about my safety or the safety of others than they must break confidentiality and inform relevant individuals or agencies, including but not exclusively, my care co-ordinator and GP.	

Name of participant (print name).....

Signature of participant.....

Date.....

Name of researcher (print name).....

Signature of researcher .....

Date.....

N.B. Participant to retain original signed document and a copy to be retained by researcher

29/11/2017 [Version: 2]

[IRAS Number: 225815]

## Appendix Q Demographic and Clinical Questionnaire (Study Two)

Participant Number.....

UNIVERSITY OF  
Southampton

### Demographic Questionnaire

The following questions will help us interpret the data from the study, if you have any questions or concerns please ask the researcher. All information provided will remain confidential.

Age: .....

Gender: Male/Female/Non-Binary

Current Employment Status (please include paid/voluntary, part-time/full-time work, studying):  
.....

Years spent in formal education: .....

Marital status: Single/Married or Civil Partnership/Widowed/Divorced/Separated

What is your ethnic group?

Choose one option that best describes your ethnic group or background.

#### White

1. English / Welsh / Scottish / Northern Irish / British
2. Irish
3. Gypsy or Irish Traveller
4. Any other White background, please describe.....

#### Mixed / Multiple ethnic groups

5. White and Black Caribbean
6. White and Black African
7. White and Asian
8. Any other Mixed / Multiple ethnic background, please describe.....

#### Asian / Asian British

9. Indian
10. Pakistani
11. Bangladeshi
12. Chinese
13. Any other Asian background, please describe.....

#### Black / African / Caribbean / Black British

14. African
15. Caribbean
16. Any other Black / African / Caribbean background, please describe

#### Other ethnic group

17. Arab
18. Any other ethnic group, please describe.....

[07/08/2017] [Version: 2]

[IRAS number: 225815]

Participant Number.....

**Time since onset of symptoms of psychosis:** .....

**Time since diagnosis of psychosis:** .....

**Please briefly describe symptoms of psychosis that you experience** (please include symptom type, frequency, and duration):

.....  
.....  
.....  
.....

**Do these symptoms impact on your life? If yes, please indicate how:**

.....  
.....

**Current medication:** .....

**Do you have any other mental health conditions? If yes, please state:**

.....

**Have you previously engaged in psychological therapy? Y/N**

If your answer was yes please describe the treatment (e.g. Cognitive Behavioural Therapy) and what this was for (e.g. to treat psychosis symptoms or other mental health condition)

.....  
.....  
.....

**How long did you participate in this treatment?** .....

**When did you complete/end this treatment?** .....|

**Did you find this treatment helpful? Y/N**

**Did this treatment include any imagery exercises? Y/N**

## Appendix R      Green Paranoid Thoughts Scale

### *Green et al. Paranoid Thought Scales*

Please read each of the statements carefully.

They refer to thoughts and feelings you may have had about others over the last month.

Think about the last month and indicate the extent of these feelings from 1 (Not at all) to 5 (Totally).

Please complete both Part A and Part B.

(N.B. Please do not rate items according to any experiences you may have had under the influence of drugs.)

Part A	Not at all	Somewhat			Totally
1. I spent time thinking about friends gossiping about me	1	2	3	4	5
2. I often heard people referring to me	1	2	3	4	5
3. I have been upset by friends and colleagues judging me critically	1	2	3	4	5
4. People definitely laughed at me behind my back	1	2	3	4	5
5. I have been thinking a lot about people avoiding me	1	2	3	4	5
6. People have been dropping hints for me	1	2	3	4	5
7. I believed that certain people were not what they seemed	1	2	3	4	5
8. People talking about me behind my back upset me	1	2	3	4	5
9. I was convinced that people were singling me out	1	2	3	4	5
10. I was certain that people have followed me	1	2	3	4	5
11. Certain people were hostile towards me personally	1	2	3	4	5
12. People have been checking up on me	1	2	3	4	5
13. I was stressed out by people watching me	1	2	3	4	5
14. I was frustrated by people laughing at me	1	2	3	4	5
15. I was worried by people's undue interest in me	1	2	3	4	5
16. It was hard to stop thinking about people talking about me behind my back	1	2	3	4	5

### Part B

1. Certain individuals have had it in for me	1	2	3	4	5
2. I have definitely been persecuted	1	2	3	4	5
3. People have intended me harm	1	2	3	4	5
4. People wanted me to feel threatened, so they stared at me	1	2	3	4	5
5. I was sure certain people did things in order to annoy me	1	2	3	4	5
6. I was convinced there was a conspiracy against me	1	2	3	4	5
7. I was sure someone wanted to hurt me	1	2	3	4	5
8. I was distressed by people wanting to harm me in some way	1	2	3	4	5
9. I was preoccupied with thoughts of people trying to upset me deliberately	1	2	3	4	5
10. I couldn't stop thinking about people wanting to confuse me	1	2	3	4	5
11. I was distressed by being persecuted	1	2	3	4	5
12. I was annoyed because others wanted to deliberately upset me	1	2	3	4	5
13. The thought that people were persecuting me played on my mind	1	2	3	4	5
14. It was difficult to stop thinking about people wanting to make me feel bad	1	2	3	4	5
15. People have been hostile towards me on purpose	1	2	3	4	5
16. I was angry that someone wanted to hurt me	1	2	3	4	5



## Appendix S      Psychosis Attachment Measure

(PAM; Berry et al., 2006)

We all differ in how we relate to other people. This questionnaire lists different thoughts, feelings and ways of behaving in relationships with others.

### PART A

Thinking generally about how you relate to other key people in your life, please use a tick to show how much each statement is like you. Key people could include family members, friends, partner or mental health workers.

There are no right or wrong answers

	<b>Not at all</b>	<b>A little</b>	<b>Quite a bit</b>	<b>Very much</b>
1. I prefer not to let other people know my 'true' thoughts and feelings.	(..)	(..)	(..)	(..)
2. I find it easy to depend on other people for support with problems or difficult situations.	(..)	(..)	(..)	(..)
3. I tend to get upset, anxious or angry if other people are not there when I need them.	(..)	(..)	(..)	(..)
4. I usually discuss my problems and concerns with other people.	(..)	(..)	(..)	(..)
5. I worry that key people in my life won't be around in the future.	(..)	(..)	(..)	(..)
6. I ask other people to reassure me that they care about me.	(..)	(..)	(..)	(..)
7. If other people disapprove of something I do, I get very upset.	(..)	(..)	(..)	(..)

8. I find it difficult to accept help from other people when I have problems or difficulties.	(..)	(..)	(..)	(..)
9. It helps to turn to other people when I'm stressed.	(..)	(..)	(..)	(..)
10. I worry that if other people get to know me better, they won't like me.	(..)	(..)	(..)	(..)

	<b>Not at all</b>	<b>A little</b>	<b>Quite a bit</b>	<b>Very much</b>
11. When I'm feeling stressed, I prefer being on my own to being in the company of other people.	(..)	(..)	(..)	(..)
12. I worry a lot about my relationships with other people.	(..)	(..)	(..)	(..)
13. I try to cope with stressful situations on my own.	(..)	(..)	(..)	(..)
14. I worry that if I displease other people, they won't want to know me anymore.	(..)	(..)	(..)	(..)
15. I worry about having to cope with problems and difficult situations on my own.	(..)	(..)	(..)	(..)
16. I feel uncomfortable when other people want to get to know me better.	(..)	(..)	(..)	(..)

## PART B

In answering the previous questions, what relationships were you thinking about?

---

(E.g. relationship with mother, father, sister, brother, husband, wife, friend, romantic partner, mental health workers etc)

## Appendix T      Brief State Adapted Paranoia Checklist

(Lincoln et al., 2010)

### State Adapted Paranoia Checklist (PC) Brief version.

The following questionnaire deals with thoughts and feelings that one may experience in certain situations.

For each of the feelings and thoughts described below, please indicate how much they apply to you at the moment.

Feel free to answer based on what first came to your mind. There are no right or wrong answers.

	0 = Not at all											10 = very much
1. I need to be on my guard against others.	0	1	2	3	4	5	6	7	8	9	10	
2. People are trying to make me upset.	0	1	2	3	4	5	6	7	8	9	10	
3. Strangers and friends look at me critically.	0	1	2	3	4	5	6	7	8	9	10	
4. People are laughing at me.	0	1	2	3	4	5	6	7	8	9	10	
5. My actions and thoughts might be controlled by others.	0	1	2	3	4	5	6	7	8	9	10	

## Appendix U     Imagery Development Script (Study Two)

### Secure Attachment Imagery – Interview Script

Participant Number: \_\_\_\_\_ Interviewer:

\_\_\_\_\_

Date: \_\_\_\_\_

I'd like you to think of a time when you were with other people – it may be just one other person or a group, it could be a family member or a friend or friends – a time when you felt relaxed, safe and secure, when you felt you could trust the person or people you were with.

Q1: Can you think of a time like this when you felt relaxed, safe and secure with another person or people (*pause*)?

Q2: Can you briefly tell me about it?

Q3: Please rate how secure you felt on a scale of 0 to 100 where 0 = not at all secure, and 100 = completely secure.

Q4: Now rate how much you trusted the other person / people on a scale of 0 to 100 where 0 = not at all trusting, and 100 = completely trusting.

*If neither rating above 60%, return to Q1 and ask for another time when these feelings were a little stronger.*

When we feel safe and secure with other people, and confident that we can trust them, we often feel good about ourselves and have an image or a sense of ourselves.

Q5: Do you have an image or sense of yourself when you remember this time? YES / NO.

*If no, return to Q1 and ask for another time when these feelings were strong.*

Now you have identified a situation when you felt safe and secure, please *close your eyes* and remember this time as clearly as possible. Bring to mind the image as clearly as possible while I ask you some questions.

Q6: What is happening in the image that you can see right now? Can you describe what is going on?

Q7: What are you doing? If I were watching this on a screen or TV, what would I see?

Q8: Who are you with?

Q9: What can you see and hear?

Q10: What is the other person / are the other people doing?

Q11: What do you look like to the other person / people? If someone else could see the situation, and had to describe you, what would they see?

Thank you – you're doing well. Let me check I've understood (*summarise, eliciting any further details*).

Now I'd like you to stay focusing on yourself in that situation. Try to get a really clear picture or sense of yourself – where you are, who you are with, what you are doing, how you are feeling (*pause*).

Q12: How vivid or clear is the image or sense of yourself right now, on a scale of 0 to 100 where 0 = not at all vivid, and 100 = extremely vivid?

*If rating less than 60%, say: Just take a moment to recreate the image as vividly as possible (pause). How vivid is the image now? If still less than 60%, return to Q6 to gather more sensory detail, and then re-rate.*

*Continue regardless of rating.*

Q13: As you think about the situation now, do you have any sensations in your body?

Q14: What emotions do you feel now as you hold the image in mind?

Q15: Can you rate the (*name emotion*) on a scale of 0 to 100 where 0 = not at all strong, and 100 = extremely strong?

Q16: Do you feel any other emotions as you hold this image in mind? *Rate each emotion.*

Q17: Now keeping that image clearly in mind, can you focus on your sense of yourself?

Do you have a clear and vivid image of yourself in this situation – a picture or clear sense of yourself? YES / NO

*If NO, ask: Can you describe (insert person's own words to refer to image) to me?*

*Use prompts from Q6 if necessary.*

Q18: How secure do you feel when you focus on this image? Can you rate this on a scale of 0 to 100 where 0 = not at all secure, and 100 = extremely secure?

I am going to summarize what you have described to me and afterwards I'd like you to let me know if I have captured your image correctly *(include sensations and emotions but not ratings)*.

Now I'd like you to hold this safe, secure, trusting image of yourself in mind as best you can, while you complete the questionnaires for a second time.

Please open your eyes.



## **Appendix V      Standardised Imagery Intervention Script for Audio Recording (Study Two)**

For this imagery practice please make sure that you remove any distractions around you, for example switch off the TV. Find somewhere that you feel calm and make yourself comfortable. If it feels ok please close your eyes and take two deep breaths in.... and out..., in.... and out...

Now bring to mind the image of you and.....[insert relationship to person] when you were.....[insert age] and you were.....[insert activity]. This is a place you feel calm and secure.

Stay focused on this image and try to get a really clear picture or sense of what it was like.

[Pause]

Notice what is happening in the image.

[Pause]

Notice what you are doing in the image.

[Pause]

Take a look around you and notice what you can see- any colours, light, reflections, or movements.

[Pause]

Notice what you can hear – close or distant sounds, soft or loud.

[Pause]

Draw your attention to who else is there with you.

[Pause]

Notice what they are doing.

[Pause]

Think about how you would look to the other people.

[Pause]

As you think about it now notice any sensations in your body.

[Pause]

Now keeping this image clearly in mind and focus on how you feel about yourself.

[Pause]

Really focus in on this feeling about yourself.

[Pause]

And as this task comes to end take two more deep breaths. Hold this image in mind when completing the questions. Now open your eyes when you are ready.

## Appendix W    Percentage Variation Around the Baseline Means on State Measures

		Upper Score % Change from Mean	Interpretation	Lower Score % Change from Mean	Interpretation
Participant					
<u>One</u>					
	Paranoia Checklist	57.42	Questionable	46.15	Questionable
	PANAS Negative	37.00	Questionable	34.04	Questionable
	PANAS Positive	<b>19.83</b>	Reasonable	42.90	Questionable
Participant					
<u>Two</u>					
	Paranoia Checklist	31.83	Questionable	41.84	Questionable
	PANAS Negative	<b>17.65</b>	Reasonable	<b>25.49</b>	Borderline
	PANAS Positive	34.30	Questionable	38.02	Questionable

*Note.* Percentages in bold indicate an acceptable variation from the baseline mean, based on suggested criteria (Morley, 2018)

## Appendix X Debrief Statement (Study Two)



### The impact of repeated Imagery practice on mood and wellbeing

#### Debriefing Statement

The aim of this research was to explore the impact of an imagery task on levels of paranoia. It is expected that the imagery practice will reduce levels of paranoia and distress. Your data will help our understanding of the use of imagery interventions in people who struggle with paranoia, as well as our understanding of the role of early relationships in the experience of paranoia. It is thought that, along with other complex factors, our early relationships may be a contributory factor in the development and maintenance of symptoms of psychosis, such as paranoia. Therefore, the present study aimed to explore if activating a positive early relationship through the use of imagery would have a beneficial impact on symptoms of paranoia and distress.

Once again results of this study will not include your name or any other identifying characteristics. If you would like to receive results from the outcome of this study please inform the researcher and provide email contact details. Please be aware that this may take up to 18 months to complete.

If you have any further questions please contact Cathryn Pitfield at [cp19q15@soton.ac.uk](mailto:cp19q15@soton.ac.uk).

**I would like to take this opportunity to thank you for your participation in this research.**

Signature \_\_\_\_\_ Date \_\_\_\_\_

Name \_\_\_\_\_

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, SO17 1BJ. Phone: +44 (0)23 8059 3856, email [fshs-rso@soton.ac.uk](mailto:fshs-rso@soton.ac.uk)

If participation in this study has affected you and you require further support please contact your Care Co-Ordinator, and/or GP. Alternatively, you can contact The Samaritans anonymously (116123) for additional support. Participation in this study will not have affected your care from your mental health team.

## Appendix Y Completed SCED Scales

- Couldn't specify pg numbers.

**SCED Scale**

**Rating Scale for Single Participant Designs**

For each item, please justify scoring (for both "yes" and "no" responses), by at least mentioning page and paragraph numbers in the field underneath the tick boxes.

	Rater 1:		Rater 2:		Consensus	
	yes	no	yes	no	yes	no
1. Clinical history was specified. <i>Must include Age, Sex, Aetiology and Severity.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Target behaviours. Precise and repeatable measures that are operationally defined. <i>Specify measure of target behaviour.</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Design 1: 3 phases. Study must be either A-B-A or multiple baseline ?	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Design 2: Baseline (pre-treatment phase). Sufficient sampling was conducted	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Design 3: Treatment phase. Sufficient sampling was conducted	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Design 4: Data record. Raw data points were reported	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Observer bias: Inter-rater reliability was established for at least one measure of target behaviour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Independence of assessors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Statistical analysis	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Replication: <i>either across subjects, therapists or settings</i>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Evidence for generalisation	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Handwritten notes on the form:

- mention operationalised by...
- need to state target behaviour?
- Min 7 - evidence as to why sufficient
- Daily for 7 days.
- in text & table.
- N/A STANDARDISED MEASURE
- N/A STANDARDISED MEASURE
- Visual Inspection & Mood's Median test, t-test, U.
- 2 SUBJECTS
- For participant 2.

## SCED Scale



### Rating Scale for Single Participant Designs

For each item, please justify scoring (for both "yes" and "no" responses), by at least mentioning page and paragraph numbers in the field underneath the tick boxes.

	Rater 1:		Rater 2:		Consensus	
	yes	no	yes	no	yes	no
1. Clinical history was specified. <i>Must include Age, Sex, Aetiology and Severity.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	specify page & paragraph		specify page & paragraph		specify page & paragraph	
2. Target behaviours. Precise and repeatable measures that are operationally defined. <i>Specify measure of target behaviour.</i>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Design 1: 3 phases. Study must be either A-B-A <u>or</u> multiple baseline	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Design 2: Baseline (pre-treatment phase). Sufficient sampling was conducted	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Design 3: Treatment phase. Sufficient sampling was conducted	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Design 4: Data record. Raw data points were reported	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Observer bias: Inter-rater reliability was established for at least one measure of target behaviour	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Independence of assessors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Statistical analysis	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Replication: <i>either</i> across subjects, therapists or settings	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Evidence for generalisation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Appendix Z      University of Southampton Ethics Approval (Study Two)

University of Southampton Ethics and Research Governance Approval

The screenshot shows the ERGO II (Ethics and Research Governance Online) interface. The header includes the University of Southampton logo and navigation links for Home and Submissions. The main content area displays the submission title and a tabbed interface with 'Submission Overview' selected. Below the tabs, a 'Details' section shows the submission status as 'Approved' and the category as 'Category A', indicated by a red 'A' in a circle. At the bottom, a note states: 'The end date for this study is currently 31 October 2018'.

31666 - Impact of a Brief Attachment-Based Imagery Intervention on Paranoia in Psychosis: A Single Case Series Pilot Study. (Amendment 1)			
Submission Overview	Submission Questionnaire	Attachments	History
Details			
Status	Approved		
Category	Category A		
The end date for this study is currently 31 October 2018			

## Appendix AA NHS Research Ethics Committee and HRA Approval



### West Midlands - Edgbaston Research Ethics Committee

The Old Chapel  
Royal Standard Place  
Nottingham  
NG1 6FS

08 December 2017

Miss Cathryn Pitfield



University of Southampton  
University Road  
SO17 7BJ

Dear Miss Pitfield

<b>Study title:</b>	<b>Impact of a brief attachment-based imagery intervention on paranoia in psychosis: A single-case series pilot study.</b>
<b>REC reference:</b>	<b>17/WM/0420</b>
<b>IRAS project ID:</b>	<b>225815</b>

Thank you for your letter of 30 November 2017, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact [hra.studyregistration@nhs.net](mailto:hra.studyregistration@nhs.net) outlining the reasons for your request.

#### Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.



### **Conditions of the favourable opinion**

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

*Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).*

*Guidance on applying for NHS permission for research is available in the Integrated Research Application System, [www.hra.nhs.uk](http://www.hra.nhs.uk) or at <http://www.rdforum.nhs.uk>.*

*Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.*

*For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.*

*Sponsors are not required to notify the Committee of management permissions from host organisations*

### **Registration of Clinical Trials**

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact [hra.studyregistration@nhs.net](mailto:hra.studyregistration@nhs.net). The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

**It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).**

### **Ethical review of research sites**

#### NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

#### Non-NHS sites

The Committee has not yet completed any site-specific assessment (SSA) for the non-NHS research site(s) taking part in this study. The favourable opinion does not therefore apply to any non-NHS site at present. We will write to you again as soon as an SSA application(s) has been reviewed. In the meantime no study procedures should be initiated at non-NHS sites.

#### Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	Version	Date
Copies of advertisement materials for research participants [Poster advert]	1	11 July 2017
Copies of advertisement materials for research participants [email advert for staff]	1	01 June 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Insurance letter]	1	14 July 2017
GP/consultant information sheets or letters [GP letter]	1	11 July 2017
Interview schedules or topic guides for participants [Script for audio clip]	1	01 June 2017
Interview schedules or topic guides for participants [Imagery script]	1	01 June 2017
IRAS Application Form [IRAS_Form_01112017]		01 November 2017
Letter from sponsor [Sponsor letter]	1	26 September 2017
Non-validated questionnaire [Demographic Questionnaire]	2	07 August 2017
Participant consent form [Consent Form]	2	29 November 2017
Participant information sheet (PIS) [Participant receipt of payment]	1	07 August 2017
Participant information sheet (PIS) [Participant Information Sheet]	3	29 November 2017
Participant information sheet (PIS) [Debrief form]	2	29 November 2017
Research protocol or project proposal [Protocol]	3	23 October 2017
Sample diary card/patient card [Participant booklet - including manipulation check and qualitative questions]	2	29 November 2017
Summary CV for Chief Investigator (CI) [Chief investigator Short CV]	1	16 October 2017
Summary CV for supervisor (student research) [Sup CV - Dr Newman-Taylor]	1	12 October 2017
Summary CV for supervisor (student research) [Sup CV - Dr Maguire]	1	16 October 2017
Validated questionnaire [Green Paranoid Thoughts Questionnaire]	1	
Validated questionnaire [Paranoia Checklist]	1	12 October 2017
Validated questionnaire [Psychosis Attachment Measure]	1	12 October 2017
Validated questionnaire [Positive and Negative affect Scale]	1	12 October 2017

### Statement of compliance

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

### After ethical review

#### Reporting requirements

The attached document "*After ethical review – guidance for researchers*" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

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

### User Feedback

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

<http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/>

### HRA Training

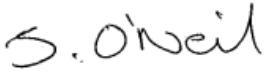
We are pleased to welcome researchers and R&D staff at our training days – see details at <http://www.hra.nhs.uk/hra-training/>

17/WM/0420
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Please quote this number on all correspondence
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With the Committee's best wishes for the success of this project.

Yours sincerely

pp. 

**Mr Paul Hamilton**  
Chair

## Appendix BB Health Research Authority Ethics Approval (Study Two)

**NHS**  
Health Research  
Authority  
Skipton House  
80 London Road  
London SE1 8LH

Tel: 0207 104 8010  
Email: [hra.approval@nhs.net](mailto:hra.approval@nhs.net)

Miss Cathryn Pitfield



08 December 2017

Dear Miss Pitfield

### Letter of **HRA Approval**

Study title:	Impact of a brief attachment-based imagery intervention on paranoia in psychosis: A single-case series pilot study.
IRAS project ID:	225815
REC reference:	17/WM/0420
Sponsor	University of Southampton

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

#### Participation of NHS Organisations in England

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

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

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

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

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