

Momentary social and psychological predictors of positive psychotic symptoms

A thesis submitted to The University of Manchester for the degree of Doctor of
Clinical Psychology in the Faculty of Biology, Medicine and Health

2019

Kate Lawrence

SCHOOL OF HEALTH SCIENCES

Division of Psychology and Mental Health

Table of Contents

List of Tables	3
List of Figures	4
List of appendices	5
Thesis Abstract	6
Declaration	7
Copyright and ownership	7
Acknowledgements	8
Paper 1: Systematic Review	9
Abstract	10
Summations	11
Limitations	11
Introduction	12
Aims	13
Method	14
<i>Eligibility criteria, search strategy and procedure</i>	14
<i>Search results, paper screening, reliability and data extraction</i>	15
<i>Risk of bias assessment</i>	15
Results	16
<i>Overview of studies</i>	16
<i>Risk of bias</i>	16
<i>Momentary predictors of psychosis symptoms</i>	17
Discussion	26
<i>Summary of findings</i>	26
<i>Limitations</i>	28
<i>Clinical implications and directions for future research</i>	29
References	32
Paper 2: Empirical Study	54
Abstract	55
Significant Outcomes	56

Limitations	56
Introduction	57
Aims	59
Method	61
Results	67
Discussion	71
References	77
Paper 3. Critical reflection.....	103
Introduction	104
Systematic literature review (Paper 1)	104
<i>Rationale and review process</i>	<i>104</i>
<i>Risk of bias assessment</i>	<i>105</i>
<i>Synthesising data.....</i>	<i>106</i>
Empirical Paper (Paper 2).....	107
<i>Development of momentary measures of proximity seeking</i>	<i>107</i>
<i>Trait attachment measure.....</i>	<i>108</i>
<i>Experience Sampling Methodology</i>	<i>109</i>
<i>Analysis of Experience Sampling Methodology Data</i>	<i>110</i>
<i>Dissemination and participant engagement</i>	<i>111</i>
<i>Personal reflections</i>	<i>111</i>
References	113
Appendix A	128
Appendix B:	139
Appendix C:	145
Appendix D	155
Appendix E.....	176
Appendix F.....	178
Appendix G	185
Appendix H	186
Appendix I.....	191
Appendix J:.....	193

Total word count: 17,845 (excluding references and tables)

List of Tables

Paper 1: systematic review

Table 1: Overview of Studies Included in the Review.....	41
Table 2: Results of Risk of Bias Assessment.....	46
Table 3: Summary of Differences and Effect Sizes for Reviewed Studies.....	49
Table 4: Results of Multilevel Regression Analyses.....	145
Table 5: Momentary Items of Positive Psychotic Symptoms.....	155

Paper 2: empirical paper

Table 1: Participant Demographics and Scores on Baseline Measures	90
Table 2: Effect of Stress on Level of Proximity Seeking and Moderation Effects of Person-level Attachment Style	92
Table 3: Effect of Stress on Change in Proximity Seeking and Moderation Effects of Person-level Attachment Style.....	96
Table 4: Effect of Change in Proximity Seeking on Level of Paranoia and Moderation Effects of Person-level Attachment Style	100

List of Figures

Paper 1: systematic review

Figure 1: Search process and results.....53

Paper 2: empirical paper

Figure 1: Margin plot illustrating the moderating effect of avoidant attachment on the relationship between change in proximity seeking and paranoia.....102

List of appendices

Appendix A: Instructions to authors: Acta Psychiatrica Scandinavica	128
Appendix B: Risk of bias assessment tool.....	139
Appendix C: Table 4: Momentary Items of Positive Psychotic Symptoms.....	145
Appendix D: Table 5. Results of multilevel regression analyses.....	155
Appendix E: University Ethical Approval.....	176
Appendix F: Baseline Questionnaire Measures.....	178
Appendix G: Experience Sampling Methodology Items.....	185
Appendix H: Participant Information Sheet.....	186
Appendix I: Participant Consent Form	191
Appendix J: Participant Debrief Sheet.....	193

Thesis Abstract

The current thesis titled 'Momentary social and psychological predictors of positive psychotic symptoms' has been prepared by Kate Lawrence in the year 2019. The thesis has been submitted to The University of Manchester for the degree of Doctor of Clinical Psychology in the Faculty of Biology, Medicine and Health. The thesis has been prepared in paper-based format and comprises three papers. The overall theme of the thesis is the investigation of momentary social and psychological predictors of positive psychotic symptoms, specifically hallucinations and delusions.

Firstly, a systematic literature review to elucidate associations between momentary psychological and social predictors and positive psychotic symptomatology is presented. Paper 1 provides a comprehensive review of 34 studies investigating psychological and social predictors of positive psychotic symptoms. The review critically synthesises and evaluates the research that has been carried out and published to date. The most consistent psychosocial predictors were negative affect, cognitive processes and stress sensitivity. There was a lack of recurring support for other psychosocial predictors namely, the social and familial environment, self-esteem, attachment insecurity, self-stigma and social media use. The results are considered in relation to methodological limitations, clinical implications and recommendations for future research.

Secondly, an experience sampling methodology study was conducted to explore associations between proximity seeking, stress and paranoia in the context of daily life, and whether these relationships are moderated by trait attachment styles. Paper 2 presents an investigation involving 60 nonclinical participants. Participants completed state measures of stress, proximity seeking and paranoia six-times per day for 14-days. The results of multilevel regression analyses indicated that greater stress leads to shifts or disturbance in proximity seeking, but these alone are not associated with momentary paranoia. However, for individuals with an avoidant attachment style, greater shifts in proximity seeking were associated with greater reports of paranoia at subsequent timepoints, highlighting the need to consider the contribution of attachment representations to paranoid thinking. The findings are considered in relation to limitations of the study, recommendations for future research, and possible clinical and theoretical implications.

Thirdly, a critical evaluation and reflection of the two papers mentioned above was conducted. Strengths and weaknesses regarding the chosen methodology, directions for theory, clinical implications and future research were considered. Finally, the overall research process was reflected upon.

Declaration

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

Copyright and ownership

The author of this thesis (including any appendices and/or schedules to this thesis) owns certain copyright or related rights in it (the “Copyright”) and s/he has given The University of Manchester certain rights to use such Copyright, including for administrative purposes.

Copies of this thesis, either in full or in extracts and whether in hard or electronic copy, may be made only in accordance with the Copyright, Designs and Patents Act 1988 (as amended) and regulations issued under it or, where appropriate, in accordance with licensing agreements which the University has from time to time. This page must form part of any such copies made.

The ownership of certain Copyright, patents, designs, trademarks and other intellectual property (the “Intellectual Property”) and any reproductions of copyright works in the thesis, for example graphs and tables (“Reproductions”), which may be described in this thesis, may not be owned by the author and may be owned by third parties. Such Intellectual Property and Reproductions cannot and must not be made available for use without the prior written permission of the owner(s) of the relevant Intellectual Property and/or Reproductions.

Further information on the conditions under which disclosure, publication and commercialisation of this thesis, the Copyright and any Intellectual Property and/or Reproductions described in it may take place is available in the University IP Policy (see <http://documents.manchester.ac.uk/DocuInfo.aspx?DocID=24420>), in any relevant Thesis restriction declarations deposited in the University Library, The University Library’s regulations (see <http://www.library.manchester.ac.uk/about/regulations/>) and in The University’s policy on Presentation of Theses.

Acknowledgements

Firstly, I would like to offer my gratitude to all those who agreed to take part in my research and give up their valuable time. I would like to thank my supervisors Sandra Bucci, Peter Taylor and Katherine Berry, who provided support, guidance and encouragement throughout the research process. My thanks also go to Lesley-Anne Carter, who generously contributed her expertise and statistical advice to this project. I would like to thank the 2019 ClinPsyD cohort at the University of Manchester; the friendship, support and humour we have experienced together will never be forgotten. A very special thank you goes to my parents for their unwavering understanding, encouragement and confidence in my ability to reach this achievement. To S, thank you for all your love, support and endless cups of tea. To my grandma, we did it.

Paper 1: Systematic Review

**Momentary psychological and social predictors of positive psychotic symptoms: a
systematic review**

**The following paper has been prepared for submission to ‘Acta Psychiatrica
Scandinavica.’ The guidelines for authors can be found in Appendix A.**

Word count: 7,224 (excluding tables and references)

Abstract

Objectives: This review sought to examine and critically appraise studies that examined associations between momentary psychological and social predictors and positive psychotic symptomatology.

Methods: An electronic database search of PsycINFO, MEDLINE, EMBASE and Web of Science from 1900 up to February 2019 was conducted using keyword search terms synonymous with experience sampling methodology and psychosis.

Results: The review identified 34 eligible studies which employed experience sampling methodology. The most consistent psychological predictors of positive psychotic symptoms were negative affect, cognitive processes and stress sensitivity. There was a lack of converging findings for other predictors, namely the social and familial environment, attachment insecurity, self-stigma and social media use. Findings were generally based on studies with small samples, and momentary measures of predictors and psychotic symptoms were vastly discrepant, making comparison of effect sizes across studies problematic.

Conclusions: Findings suggest that negative affect, cognition and stress sensitivity are implicated in momentary psychosis-related experiences. It is unclear the extent to which these processes are independent from each other, or the temporal order in which such processes may lead to positive psychotic symptoms. We recommend future research employ larger samples and more complex modelling techniques to permit exploration of the pathways between predictors and psychotic symptoms.

Key Words: Systematic Review; Experience Sampling Methodology; Psychosis; Hallucinations; Delusions

Summations

- This review of the Experience Sampling Methodology literature aimed to elucidate associations between momentary psychological and social predictors and positive psychotic symptomatology.
- Evidence was most consistent for the role of negative affect, cognitive processes and stress sensitivity in momentary experiences of psychosis.
- Other putative psychological predictors (e.g. attachment insecurity, self-esteem and some forms of social media use) were supported by individual studies.

Limitations

- Findings were generally based on studies with small samples, meaning only tentative conclusions can be drawn.
- Momentary measures of predictors and psychotic symptoms were vastly discrepant, making comparison of effect sizes across studies problematic.

Introduction

Research has consistently indicated that psychosis exists on a continuum with normal experiences^{1,2}. Recent epidemiological studies have shown that approximately 10% of the population have experienced hallucinations and delusions,^{3,4} providing evidence for these experiences occurring along a continuum. The continuum model of psychosis suggests that experiences such as hallucinations and delusions, are a dimensional phenomenon lying on a continuum with normality and therefore are not necessarily associated with the presence of a disorder (see Verdoux & van Os, 2002⁵ for a review). In accordance with the continuum model of psychosis, investigating specific symptoms of psychosis rather than diagnostic categories permits more acuity in the theoretical justifications and testing of hypotheses regarding the role of psychological and social processes in the occurrence of psychotic experiences, whilst also recognising that these processes may differ by symptom⁶. Furthermore, it is suggested that studying specific symptoms or experiences (e.g. hallucinations, paranoia) enables therapeutic interventions to be targeted more appropriately to distinct types of experiences rather than treating psychosis as a ‘condition.’^{7,8}

Adopting a continuum view of psychosis has resulted in researchers within the field of psychosis beginning to investigate the putative social and psychological mechanisms hypothesised to underlie the symptoms of psychosis on a momentary level, as they occur in the context of daily life^{9,10}. Several cognitive affective models of psychosis^{11–15} have been proposed in which a trigger (whether internal, such as an intrusive thought or image, or external, such as another individual’s behaviour) is misinterpreted. This misinterpretation of anomalous experiences is driven by cognitive processing, reasoning and attributional biases which are, in turn, reciprocally influenced by negative emotions and behavioural responses occurring in response to this triggering event or anomalous experience. Researchers have consistently evidenced the significant role of the social environment and interpersonal experience in influencing an individual’s biased appraisals of anomalous experiences and associated behavioural responses¹⁶; and thus researchers have increasingly begun to investigate the different contributions of such processes in the occurrence of positive psychotic symptoms in the flow of daily life^{9,10}. To this end, research utilising Experience Sampling Methodology (ESM), a structured self-report diary-based methodology that captures the frequency, intensity and patterning of momentary mental processes and behaviour,¹⁷ has substantially increased in the field of psychosis over the past two decades^{18,19}. ESM research in the field of psychosis has predominantly

focused on investigating the mechanisms underlying the occurrence of positive psychotic symptoms, specifically hallucinations and delusions.

ESM has several advantages compared to traditionally used assessments of psychological phenomena as participants provide real-time reports of their experiences as they naturally occur, thus minimising memory distortions and overcoming problems of retrospective recall bias^{10,18}. Second, frequent and repeated sampling enables researchers to investigate temporal relationships between variables which can be useful in estimating the impact of certain events, mental processes or behaviours on the occurrence of mental health-related phenomena such as psychotic symptoms¹⁰. Additionally, ESM yields rich data with high ecological validity as participants' experiences and person-level characteristics are assessed within, and in interaction with, their real-world context¹⁸. Furthermore, this rich data permits detailed assessment of everyday experiences (e.g. momentary thoughts or feelings) which may otherwise be overlooked or forgotten^{10,20}. However, ESM is not without limitations as participants are required to comply with a burdensome procedure which can result in refusal or unwillingness to participate, participant retention and attrition can be problematic, as can high levels of missing data¹⁰. This can in turn create a sampling bias with only highly motivated or conscientious individuals being willing to participate or fully adhere to ESM protocol, and participants are increasingly likely to drop-out at times when they are more symptomatic which may reduce variability in the data²¹. Despite these limitations, the use of ESM to examine psychosocial phenomena in the context of daily life may accelerate our understanding of mechanisms underlying psychosis⁹.

Aims

The aim of the current review is to provide a systematic review and synthesis of the current research evidence to elucidate the associations between psychological and social momentary predictors and positive psychotic symptomatology (e.g. hallucinations, delusions). In line with adopting a continuum view of psychosis,^{1,2} studies which used both clinical and non-clinical samples were sought with any divergence and implications of this discussed.

Specific aims of the current paper are to: i) provide a comprehensive systematic review of ESM studies investigating potential psychological and social predictors of positive psychotic symptomatology and ii) critically appraise the current research

evidence to determine the impact of these processes on the occurrence of positive psychotic symptoms.

Method

Eligibility criteria, search strategy and procedure

The current review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines²². The search strategy, eligibility criteria and methods of analysis were specified in advance and documented in a protocol registered with PROSPERO (<https://www.crd.york.ac.uk/PROSPERO/>; registration number: CRD42019133199).

PsycINFO, MEDLINE, EMBASE and Web of Science were systematically searched from 1900 up to 2019 using the following search string: (“experience sampl*” OR “diary” OR “ecological momentary*” OR “momentary assessment” OR “ESM” OR “EMA” OR “EMI”) combined with psychosis-related search terms (“psychosis” OR “psychoti*” OR “schizo*” OR “hallucinat*” OR “voice hear*” OR “hearing voices” OR “AVH” OR “thought disord*” OR “paranoi*” OR “delus*” OR “delud*” OR “persecut*” OR “persecutory delusion” OR “suspici*” OR “grandeur” OR “grandi*” OR “unusual belief” OR “Serious Mental” OR “Severe Mental” OR “Serious Psychiatric” OR “Severe Psychiatric” OR “Mental Illness”) using the Boolean operator “and.” Medical subject headings (MESH) in MEDLINE and subject headings in EMBASE and PsycINFO were used to further expand the results of the database search. To identify additional papers not identified in the original database search, reference lists of included studies and articles that cited included studies were examined.

Studies were included if they met the following criteria: a) were published in a peer-reviewed journal from 1900 to 2019; b) assessed participants using ESM, defined as outside laboratory, more than once-a-day sampling; c) had a momentary measure of positive psychotic symptomatology and a momentary measure of either a psychological or social predictor. Psychological predictors were defined in the current review as an aspect of cognition, behaviour, affective symptoms or mood²³. Social predictors were defined as factors associated with an aspect of an individual’s social or interpersonal environment¹⁶; d) conducted and reported appropriate analyses with a momentary social or psychological predictor as the independent variable and a momentary positive psychotic symptom (e.g. hallucinations, delusions) as the dependent variable. Person-level variables were only deemed relevant to the review’s findings if exploring the moderating effects of this

variable on associations between predictor and outcome, or for exploration of group differences; e) reported appropriate statistical information pertaining to the size of the association between predictor and outcome, and whether or not the association was statistically significant; f) assessed positive psychotic symptomatology in clinical, subclinical or nonclinical populations; and g) the mean of the age of the sample was not below 17 years to reduce potential heterogeneity and confounds. Papers were excluded if they only included genetic or biological momentary predictor(s).

Search results, paper screening, reliability and data extraction

Following removal of duplicates, articles were screened at the title, abstract and full-text level. Ten percent of titles and ten percent of abstracts identified in the search were randomly selected and screened by a second reviewer independent to the research team to assess the reliability of the screening process. Cohen's Kappa was calculated to assess the level of agreement between reviewers. Agreement at the title level, Kappa =.93 ($p < .001$), and at the abstract level, Kappa =.89 ($p < .001$), was almost perfect²⁴. Discrepancies were due to the secondary reviewer being overly inclusive and were arbitrated by the research team at regular meetings. Following this, 100% of potentially eligible full text papers were screened by the independent reviewer with perfect agreement (Kappa=1.00, $p < .001$)²⁴. The broader research team also examined the full texts to agree the final papers to be included in the review. The analytic plan was to provide a narrative synthesis of the findings of eligible studies, structured around the type of momentary predictor examined.

Risk of bias assessment

Included papers were assessed for risk of bias using an adapted version of the Agency for Healthcare Research and Quality risk of bias tool²⁵ (see Appendix B). This tool has been utilised for observational data in other reviews^{26,27} and can be specifically adapted for the context of the review. The tool assesses risk of bias across multiple methodological domains (the representativeness and description of the cohort; validity of methods used to ascertain participant clinical status, and measure predictors and outcomes; appropriateness of the analyses conducted, including consideration of confounding variables). Additional domains were added to the tool to assess methodological aspects specific to ESM, namely: whether the study utilised equipment which provided a time-stamped response; whether

prompts were sent at pseudo-random timepoints; the amount of missing momentary data and how this missing data was classified; and the conditions under which participants' momentary data was included in the final analysis. Domains were rated using the terms yes, no, partial and unclear. Two reviewers independently assessed risk of bias for all articles and discrepancies were discussed. The initial level of agreement between the two reviewers was 91%, which after discussion resolved to 100% agreement.

Results

Overview of studies

Figure 1 shows the full search process, in line with PRISMA guidelines²². Overall 34 eligible papers were identified. Table 1 summarises the characteristics of the eligible studies. Papers were from the UK (n=13), Netherlands (n=10), Germany (n=4), USA (n=3), Spain (n=2), Belgium (n=1) and France (n=1). Studies included both clinical (n=16), non-clinical (n=8) and mixed clinical samples (n=11). Sample sizes ranged from 12 to 654. Most studies included participants of both genders with two studies including females only^{28,29}. The reviewed studies assessed the momentary psychological and social predictors of a range of positive psychotic symptomatology: psychotic experiences (n=8); delusions regardless of type (n=5); paranoia or persecutory delusions (n=21); delusions of control (n=1); delusions of reference (n=1); delusions of grandiosity (n=1), hallucinations (n=7), other/miscellaneous psychotic outcomes (n=3). Although 34 separate studies were reviewed, 20 unique samples were identified due to a significant overlap in samples between studies (see Table 1 for details). Appendix C presents the ESM items utilised in each study to assess positive psychotic symptomatology.

Risk of bias

Results of the risk of bias assessment are shown in Table 2. Recurrent issues included a lack of clarity around procedures for identifying and recruiting potential participants thereby making it difficult to judge the likelihood of selection bias. A minority of studies did not use valid measures to determine participants' diagnoses or clinical 'caseness.' Reviewed studies generally provided an adequate description of the cohort but there were discrepancies as to the amount of demographic or clinical information provided. Regarding measures of momentary predictors and outcomes, studies did not always report whether momentary items had been previously employed in ESM research or their psychometric

properties. Furthermore, some studies developed their own momentary items to assess constructs of interest not previously examined and failed to undertake formal evaluation of the psychometric properties of the scale or items employed.

All studies failed to justify their sample size making it difficult to determine whether negative findings may in fact be a type-2 error (false negative) resulting from insufficient power. Moreover, authors dichotomising variables for analyses further blurs the picture regarding issues of power. Additionally, unjustified sample sizes has ramifications for judging whether the amount of missing data within a study should be considered problematic. Regarding issues of missing data, studies either failed to report the amount of missing data or, if doing so, only detailed the percentage of completed prompts but did not refer as to how this affected power within the study. Analyses of ESM data often use statistical models that can accommodate incomplete data, assuming that data are missing at random (MAR). However, few studies provided any justification for the assumption of MAR being met. If other missing data mechanisms are in operation this may result in biased results or weakening of effects^{30,31}. One study reported data were not missing at random (NMAR) but the implications of this for analytic method were not discussed. Analytic methods were generally appropriate but there was discrepancy in whether covariates (and the type of covariate) were adjusted for in the analyses.

Several studies required participants to complete paper booklets following receipt of a prompt from a digital wristwatch or PDA. This approach does not allow responses to have a clear timestamp (i.e. no electronic record of when responses are made), meaning there is a greater risk of retrospective completion of the ESM question. Furthermore, in numerous studies it was unclear whether authors had an accurate way of determining whether reports were completed within fifteen-minutes of the prompt, a period genuinely considered to represent ambulant monitoring of experiences,¹⁰ and whether reports which exceeded this fifteen-minute period were excluded from analyses. Finally, in several studies it was unclear whether participants with very low response rates (i.e., less than one third of assessments) were excluded from analyses, as is common practice¹⁰.

Momentary predictors of psychosis symptoms

Results were categorised according to the type of predictor investigated: Affect; Cognition; Environmental Stress; Social and familial environment; Self-esteem; Attachment insecurity; Self-stigma; and Social media use. Table 3 summarises the differences and

effect sizes across reviewed studies. See Appendix D for the results of the multilevel regression analyses for all predictor-outcome associations for individual studies

Affect

Fourteen reviewed studies^{29,32-44} attempted to elucidate associations between momentary affect and positive psychotic symptoms. There were discrepancies in how affect was operationalised with several studies utilising a negative^{29,33,34,37,39,40,42,44} or positive affect composite scale,^{34,37} and others instead choosing to examine associations between specific emotions^{32,35,36,38,41,43} and momentary psychotic experiences.

Significant concurrent associations were found between negative affect and momentary psychosis;^{37,40} delusional thinking;³⁴ and auditory hallucinations³⁴. Four studies found negative affect positively correlated with paranoia at the same²⁹ and subsequent timepoints^{29,39,42,44}. One study³³ failed to find a significant association between negative affect and paranoia. However, the negative affect scale used in this study had poor internal consistency (Cronbach's $\alpha=0.61$) which may have attenuated associations between variables. When covarying for momentary emotion regulation strategies, negative affect significantly predicted subsequent paranoia, which may hint at a suppression or moderating effect of rumination on the path between negative affect and paranoia; although, this warrants further investigation. One study²⁹ found a significant moderating effect of stress sensitivity on the path between negative affect and paranoia; negative affect was associated with greater increases in momentary paranoia for individuals who reported greater momentary emotional reactivity to minor stressful events ($\beta=0.07$, $p<0.01$).

Five studies^{32,35,36,38,43} attempted to elucidate associations between specific negative emotions and positive psychotic symptoms in daily life. Momentary anxiety was not predictive of the occurrence of delusions of grandiosity, control or reference³⁸ but did precede the onset of paranoia^{32,35}. This finding may be considered unsurprising as anxiety is considered to cause the threat theme of paranoid thoughts¹³. Ben-Zeev et al³² utilised a binary measure of paranoid ideation which was narrow in content, only assessing the specific experiences of feeling spied on or plotted against, which may have led to an underestimation of the association between anxiety and paranoia. Thewissen and colleagues³⁵ dichotomised their measure of momentary paranoia for analysis, thereby reducing variance in responses and possibly reducing power.

Momentary sadness was not predictive of the occurrence of delusions of grandiosity, control or reference³⁸ but did precede paranoia, although to a lesser extent than

anxiety³². Additionally, increased feelings of insecurity³⁶ and stress⁴³ predicted subsequent paranoia. The effect of preceding stress on momentary paranoia was greater for individuals who reported using more maladaptive emotion regulation strategies ($\beta=0.19$, $p=0.011$)⁴³. Thewissen and colleagues³⁵ failed to find a significant association between anger/irritability and feeling down and the onset of paranoia, when adjusting for preceding paranoia and concurrent hallucinations. Conversely, in a larger study³⁶ in which data were pooled from numerous studies thereby increasing statistical power, a significant unadjusted association was found between 'feeling down' and momentary paranoia. It is therefore possible that Thewissen et al's³⁵ failure to find a predictive effect of feeling down on paranoia may reflect a Type II error due to a lack of statistical power.

Positive affect was not predictive of psychotic experiences, assessed using a composite scale,³⁷ but was negatively correlated with concurrent auditory hallucinations and delusional thinking³⁴. No evidence was found for associations between feeling cheerful and content and momentary paranoia³⁶ but feeling relaxed was associated with a significant reduction in the fear of losing control at subsequent timepoints in patients diagnosed with a psychotic disorder but not in first-degree relatives or healthy controls⁴¹.

One study³³ found a significant positive association between emotional instability across the ESM period and momentary paranoia, as participants who experienced greater fluctuations of negative emotions reported greater levels of paranoia.

To summarise, negative affect emerged a more consistent predictor than positive affect, with larger effect sizes found for associations between negative affect and momentary psychotic symptoms which may be considered unsurprising as psychotic symptoms have been found to occur more often in a context of negative mood states at both subclinical and clinical levels of expression^{45,46}. Despite much variance in measures and constructs, a consistent, general pattern emerged in which negative affect was associated with greater reports of positive psychotic symptoms in daily life at the current moment and over time.

Cognition

Eleven studies^{33,39,40,44,47-53} have investigated the role of cognitive factors in momentary psychotic experiences.

Experiential avoidance, a psychological construct defined as an intolerance towards negatively evaluated mental experiences and associated deliberate attempts to suppress them,⁵⁴ was found to predict increases in paranoia at subsequent timepoints, when

covarying for preceding self-esteem, negative affect and paranoia^{52,53}. Conversely, no association was found between experiential avoidance and auditory hallucinations when adjusting for concurrent paranoia⁴⁷. These findings may suggest that experiential avoidance is a cognitive process unique to paranoid ideation, but this requires further exploration as only one study with a relatively small sample investigated this.

Aberrant salience, conceptualised as the attribution of novelty and personal significance to irrelevant stimuli⁵⁵ was positively correlated with concurrent psychotic symptoms⁵¹ and paranoia at subsequent timepoints³⁹. Effect sizes revealed aberrant salience had a greater effect on momentary paranoia than general psychotic symptoms and this difference may be underestimated as Reininghaus et al.⁵¹ did not adjust for preceding levels of psychotic symptoms.

Two studies^{40,51} reported significant concurrent associations between threat anticipation and psychotic symptoms.

One study⁴⁸ found proximal and time-lagged associations between rumination, worry and levels of auditory hallucinations and paranoia, but the authors failed to adjust for confounding effects. Effect sizes were smaller for the time-lagged analyses suggesting the effects of rumination were greater for the period immediately preceding the target moment. Comparison of regression coefficients revealed worry had a greater effect on paranoia than rumination, but the opposite was true for hallucinations, which may suggest that these cognitive processes are implicated to differing extents for specific symptoms of psychosis in daily life. Moreover, this finding builds on previous research using traditional retrospective measures, which has shown worry is important in delusional experiences⁵⁶ and rumination is associated with auditory hallucinations⁵⁷. Nittel et al.³³ found no evidence of associations between rumination and paranoia when covarying for negative affect which may suggest that co-occurring depression accounted for the significant effects observed in the earlier study⁴⁸.

One study⁴⁹ found thought control was associated with momentary paranoia and auditory hallucinations at subsequent timepoints but only the effect of thought control on momentary paranoia was sustained over time. Findings should be interpreted with caution as the authors developed their own momentary measures and failed to undertake any formal psychometric evaluation to determine the validity and reliability of these scales.

One study⁵⁰ found no evidence that momentary cognitive self-consciousness (mCSC; the extent to which an individual monitors or is preoccupied by their own thoughts) was associated with momentary delusional thinking or hallucinations at

subsequent timepoints but mCSC did positively correlate with delusional thinking and hallucinations at the same timepoint. These significant associations persevered when adjusting for preceding and concurrent affect and symptoms. When examining moderating effects of person-level metacognitive beliefs, mCSC was elevated prior to the occurrence of hallucinations (OR=2.02, $p<0.01$) in individuals who held trait beliefs that it was important to control their own thoughts. The momentary measure of hallucinations utilised in this study had unacceptably low internal consistency (Cronbach's $\alpha=0.29$) which may have led to associations being attenuated and thus findings should be interpreted with caution.

One study⁴⁷ found greater dissociation predicted the presence of auditory hallucinations, and the finding remained significant when covarying for concurrent paranoia. The authors examined the moderating effect of momentary stress on this and found that at times of high stress the odds of experiencing hallucinations after dissociative experiences are 10% higher ($p<0.05$) supporting the notion that stress can influence fluctuations in momentary psychotic experiences⁵⁸.

Lüdtke et al.⁴⁴ found jumping to conclusions (JTC) bias predicted increases in paranoia at subsequent timepoints. JTC bias refers to a cognitive bias in which individuals gather insufficient information prior to making decisions (for a review see Dudley, Taylor, Wickham & Hutton²⁶). However, the validity of the task including concurrent validity with more established JTC assessments such as the 'beads task,'⁵⁹ is not known.

Collectively, the findings suggest a range of different cognitive processes may exacerbate positive psychotic symptoms in the context of daily life, but there is limited recurring support for any one mechanism. The findings also support advocacy for investigating mechanisms underlying specific symptoms of psychosis as some cognitive process were found to be unique to (e.g. experiential avoidance) or had a greater effect on (e.g. worry, rumination) specific psychotic symptoms. These findings nevertheless remain preliminary as there was limited overlap across studies in the cognitive processes studies and samples were typically small.

Environmental stress

Eight studies^{40,41,50,51,60-63} investigated associations between the subjectively appraised stressfulness of the most important event that occurred between beeps and momentary psychotic experiences. Event-related stress was associated with concurrent momentary hallucinations,^{50,62} concurrent delusional thinking,^{50,62} concurrent and subsequent

paranoia^{41,60}. Results revealed event-related stress was positively correlated with reports of momentary psychosis at the same timepoint^{51,61} and subsequent timepoints⁴⁰. Conversely, a later study⁶³ failed to find evidence of an association between event-related stress and the occurrence of psychotic experiences. It is important to note, however, that the authors of the latter study dichotomised the outcome variable thereby reducing variance in responses, which may increase the risk of Type II error. Alternatively, inconsistency in findings may reflect differences in the momentary measure of psychotic experiences utilised in these four studies^{40,51,61,63} as each scale comprised different momentary items of different psychotic symptoms.

Significant concurrent and lagged associations were found between participants subjective appraisals of the stressfulness of their current activity and psychotic experiences,^{34,46,56,58} paranoia,²⁸ delusional thinking,^{50,62} and hallucinations^{50,62}. The findings of Palmier-Claus and colleagues^{50,62} should be interpreted with caution as the activity-related stress scale had poor internal consistency (Cronbach's $\alpha=0.52$) which may have resulted in an underestimation of effects.

Three studies found social stress positively correlated with momentary psychotic experiences^{51,64,65}. A later study⁴⁰ found social stress was positively associated with psychotic experiences in ARMS and nonclinical individuals, but not in individuals with first-episode psychosis. There was evidence of concurrent associations between social stress and momentary delusional thinking,^{50,62} and paranoia,⁶⁵ but not auditory hallucinations^{50,62}. The social stress scale employed by Cristóbal-Narváez et al.⁶⁵ and Palmier-Claus et al.⁶² had poor internal consistency ($\alpha=0.59$ and $\alpha=.0.59$, respectively) which may have resulted in attenuated effects.

Two studies using the same student sample^{64,65} found situational stress was positively correlated with psychotic experiences and paranoia at the same timepoints. Area-related stress was positively correlated with concurrent reports of psychotic experiences⁵¹.

One study³² estimated associations between the occurrence of several event types (housing/finance, work/education, interactions with strangers, other), regardless of their subjective stressfulness, and momentary paranoia, in a sample of schizophrenia patients and found no significant effects. In a similar vein, Myin-Germeys et al.⁶⁶ found no evidence of an association between type of activity (doing nothing, working, leisure activities) and subsequent occurrence of delusions. These two findings fit with a general pattern that subjective stress seems to be a better predictor of positive psychotic

symptomatology than actual events or more objective indicators of environmental stress. Myin-Germeys and colleagues⁶⁶ additionally found that individuals changing to do nothing (but not changing to a work or leisure activity) at the preceding timepoint was positively correlated with the occurrence of delusional thinking. However, this finding needs to be replicated as only one study with a small sample (n=48) tested this association.

These findings collectively suggest that the subjectively appraised stressfulness of minor events, situations and activities, rather than the actual type of events, are associated with greater reports of momentary psychotic symptoms, suggesting that increased stress reactivity to daily events may play a role in the occurrence of psychotic experiences in daily life.

Social and familial environment

Eight reviewed studies^{41,51,60,64-68} have attempted to elucidate the relationship between aspects of an individuals' social and familial environment and momentary psychotic experiences.

Two studies using the same student sample^{64,65} found feeling unwanted positively correlated with reports of momentary psychosis and paranoia. Additionally, increased feelings of social disconnectedness were positively associated with psychotic experiences at the same timepoint^{51,64} and paranoia at the subsequent timepoint⁶⁴.

Six studies^{41,60,64-67} examined associations between social company and momentary psychotic symptoms. Being alone was not found to predict concurrent psychotic experiences^{64,65} or paranoia^{60,64,65}. Conversely, a large study⁴¹ (n=654) found being alone was associated with a significant reduction in momentary paranoia at the subsequent timepoint in healthy controls but not individuals with psychotic disorder or first-degree relatives.

Being in the presence of familiar company was associated with significant reductions in the occurrence of delusions⁶⁶ and perceived hostility⁶⁷ but not strange impressions,⁶⁷ unusual perceptions,⁶⁷ or beliefs that one's thought could be read or influenced⁶⁷.

No significant associations were found between being in the company of less-familiar individuals and momentary delusions,⁶⁶ perceived hostility,⁶⁷ strange impressions,⁶⁷ thought influence,⁶⁷ unusual perceptions⁶⁷ or paranoia⁶⁰. Collip et al.⁶⁰ conducted analyses by subgroup according to participants' level of trait paranoia. Individuals with low or moderate levels of trait paranoia experienced significantly more

momentary paranoia when in the company of unfamiliar people compared to familiar people but this finding was not observed in individuals with high levels of trait paranoia. This finding may indicate that the beneficial effect of socialising with familiar people disappears when paranoia becomes more severe, but this hypothesis needs to be further explored in future studies. Verdoux et al.⁶⁷ found being with nonfamiliar individuals was positively correlated with unusual perceptions at the same timepoint in individuals considered to be highly vulnerable to psychosis, but this finding was no longer significant when covarying for perceived hostility.

Two studies^{66,67} investigated associations between changing company and momentary psychotic experiences. Change in company was not found to be associated with momentary delusions,⁶⁶ thought influence⁶⁷, strange impressions⁶⁷ or unusual perceptions⁶⁷. One study⁶⁷ found changing to being alone was positively correlated with perceived hostility, and conversely changing to being with familiar individuals was associated with subsequent reductions in perceived hostility. Verdoux et al.⁶⁷ found changing to being with familiar individuals was negatively correlated with strange impressions in individuals considered to be highly vulnerable to psychosis. Additionally, the authors⁶⁷ found that changing to being with nonfamiliar individuals was predictive of an increase in unusual perceptions for individuals with high trait levels of psychosis proneness.

One study⁶⁸ found participants with psychosis who reported their relatives 'taking control of them' reported greater levels of concurrent psychotic symptoms. No other significant associations between dyad contact or relatives' behaviours (encouraging, nagging, helping, keeping an eye on) and psychotic-related experiences were detected.

Cumulatively, these findings suggest that whether social company was found to be predictive of momentary psychotic experiences, depended on the type of outcome examined and in two instances^{60,67} participants level of trait psychotic symptoms. Differences across studies likely reflected large discrepancies in momentary measures of positive psychotic experiences, differences in the momentary items used to assess type of and changes in social company, and the reference category utilised in analyses. It is important to note most studies failed to report whether items had been previously validated in ESM research and did not refer to the psychometric properties of items/scales in the current research, resultantly making it difficult to determine whether measures utilised provided valid and reliable measures of momentary experiences. Additionally, perceived feelings of connectedness to others and feeling unwanted may play a role in momentary

psychosis-related experiences. These findings require further substantiating due to results being limited to a small number of studies, some of which had overlapping samples; further compounding difficulties with interpretation.

Self-esteem

Four studies^{35,52,53,69} found associations between levels of momentary self-esteem and paranoid thinking were nonsignificant when controlling for other covariates including experiential avoidance, negative affect, auditory hallucinations and attachment insecurity.

One study⁷⁰ examined associations between fluctuations in self-esteem and momentary paranoia and found that the magnitude of the reduction in self-esteem between two successive reports, rather than the level of self-esteem, was positively associated with momentary paranoia at subsequent timepoints. The size of the association was unchanged when adjusting for participants' gender, concurrent negative affect and preceding levels of paranoia. It is therefore possible that instability of self-esteem, rather than low self-esteem, may play a more important role in experiences of paranoia in daily life but further investigations are warranted.

Self-stigma

One study³⁷ reported a significant concurrent association between self-stigma and psychotic symptoms, when covarying for preceding and concurrent positive affect which have been which have been implicated in psychotic symptoms³⁷ and beliefs about one's self⁷¹. Whilst adjusting for the confounding influence of affect increases confidence in findings, results remain very preliminary due to associations between self-stigma and psychotic symptoms only being tested in one study with a very small sample (n=24).

Attachment insecurity

One study⁶⁹ reported elevated attachment insecurity significantly predicted paranoia but not auditory hallucinations when adjusting for preceding and concurrent symptoms. These findings could indicate attachment insecurity is a predictor specific to paranoid ideation. However, it is possible that the momentary measure of attachment insecurity utilised in this

study, which did not permit exploration of associations for different attachment styles may explain this finding as non-ESM research has indicated that different attachment styles are associated with the occurrence and appraisal of auditory hallucinations⁷².

Social media use

One study⁷³ found social media use was not predictive of momentary paranoia. Results showed that the type of social media use may play a more important role in paranoid thinking than whether individuals use social media or not, as posting content on social media was positively associated with subsequent paranoia but passively consuming content or using social media to directly communicate was not. When analysing specific types of self-reported behaviour on social media; posting about feelings (but not opinions, pictures/videos or daily activities), ‘venting’ on social media, viewing profiles of individuals who were not ‘friends’ on social media, and commenting on (but not liking or sharing) the posts/pictures of others led to subsequent increases in paranoia at subsequent timepoints. Conversely, passively viewing social media newsfeeds was negatively associated with momentary paranoia. Additionally, higher perceived social rank when using social media was associated with reductions in subsequent paranoia. While these results are nevertheless preliminary due to being tested in only one study with a small sample, the study was relatively robust in terms of the domains assessed by the risk of bias assessment increasing confidence in findings.

Discussion

Summary of findings

The aim of this review was to examine and critically appraise the existing research literature regarding psychological and social momentary predictors of positive psychotic symptomatology. The role of negative affect in momentary experiences of psychosis was most commonly studied. Consistent with findings from non-ESM research,^{45,46} increased negative affect was consistently associated with greater reports of positive psychotic symptoms in daily life at the current moment and over time, regardless of whether studies measured specific emotional states or employed a composite scale of negative affect. It should be noted that most of the research focused on paranoia, limiting generalisability to other types of positive psychotic experiences.

Studies supported associations between psychotic experiences and a broad range of theorised cognitive processes (e.g. aberrant salience, threat anticipation, dissociation, thought control, worry, rumination, experiential avoidance, and momentary cognitive self-consciousness) thereby generally supporting theories that emphasise the role of cognitive factors in the development and maintenance of psychotic experiences^{11,54}. However, specific cognitive processes were rarely studied by more than one study and sample sizes were typically small, so results remain preliminary. A further limitation was that studies investigated these specific cognitive processes in isolation and thus failed to consider how these different processes interact or link with each other. Findings do however support the need to test hypothesised relationships between cognitive processes and specific positive psychotic symptoms⁶ as although findings are preliminary, in the flow of daily life, certain cognitive processes appeared to be unique to or implicated to greater extents in the occurrence of specific psychosis-related symptoms⁴⁷⁻⁴⁹ thereby building on previous findings from non-ESM research^{56,57}.

The reviewed literature suggests that the perceived stressfulness of minor events and activities was a better predictor of positive psychotic symptoms than actual events. This finding fits with previous research using retrospective methods which has shown that increased affective reactivity to daily life stress is more correlated with psychosis-related difficulties than the type of event which occurs⁷⁴. This finding may be understood through a framework proposed by Garety and colleagues¹² by which affective dysregulation in response to everyday stress, irritations and hassles, may lead to biased cognitive appraisals resulting in the misattribution of anomalous experiences to external causes. Similarly, the stress-vulnerability model of psychosis⁷⁵ proposes that life-stress may act on underlying vulnerability to trigger the perception of hallucinations and delusions, and after such experiences the stress threshold needed to elicit future symptomatic responses may become reduced.

The reviewed data provided somewhat inconsistent findings regarding the presence and type of social company. Nevertheless some, albeit tentative, general patterns can be drawn as socialising with familiar people was found in some instances to predict reductions in positive psychotic symptoms^{66,67}. Conversely, for individuals with a high vulnerability for psychosis being in the presence of unfamiliar individuals was associated with subsequent increases in psychotic symptoms. Feelings of disconnectedness to others and feeling unwanted were associated with greater psychosis-related experiences and therefore befriending programmes and social skills training aimed at fostering close

relationships may serve as useful interventions for individuals experiencing psychotic symptoms.

Reviewed studies attempting to elucidate relationships between self-esteem and momentary positive psychotic symptoms, focused exclusively on paranoia as self-esteem has long been argued to be implicated in the formation of paranoid beliefs^{15,76}. Across all studies investigating this phenomenon, low self-esteem was not found to predict momentary paranoia. Instead, results suggested that instability of self-esteem may be a better predictor of paranoid thinking, supporting previous literature using retrospective methods, which have found that paranoid individuals experience substantial fluctuations in self-esteem and perceptions about deservedness of persecution, which predict subsequent levels of symptoms^{77,78}.

Other putative psychological predictors (e.g. attachment insecurity, self-esteem and some forms of social media use) were supported by individual studies, but lack of converging findings means this research remains preliminary.

Limitations

Limitations regarding the studies obtained included small samples which may have resulted in false-negative findings, and this issue is further compounded by all studies having unjustified samples. A key limitation of the reviewed research is that due to the correlational nature of the studies, the causal nature and direction of effects cannot be confirmed. Many studies did not control for confounding variables and this is specifically pertinent where other psychological processes or symptoms may be occurring concurrently; therefore, it is difficult to determine whether associations identified existed above and beyond these confounding influences. It is noteworthy that the momentary measures utilised across studies were vastly discrepant, and many did not comment on whether scales or items had been previously validated in ESM research or undertake psychometric evaluation of these scales in the current sample. It is therefore difficult to compare effect sizes across studies or determine whether the scales utilised had appropriate sensitivity to detect momentary changes in the constructs of interest. Additionally, none of the research samples were truly representative of the populations from which they had been drawn. While unrepresentativeness is a common problem in psychological research,⁷⁹⁻⁸¹ in ESM research where participants burden is high this issue is further compounded by dropout rates and failure to adhere to the ESM protocol. Whilst it has been previously shown that level of symptomatology does not necessarily relate to ability to

comply with ESM,⁴⁸ data from some reviewed studies suggests that individuals non-compliant with ESM protocol were more symptomatic,^{32,35,60} indicating that the reviewed findings may not extrapolate to individuals with more severe psychotic symptoms. Several studies had unrepresentative samples in terms of gender and education; many used self-selected participants and some recruited participants via institution agreements, where samples may be expected to be unrepresentative in terms of class, education and ethnicity, limiting the ability to generalise findings to the larger population. The issue of generalisability is further compounded by a substantial overlap in the samples among the reviewed studies, resulting in a potential skewing of the results and the inflated probability of Type I error due to multiple comparison. Finally, the cultural validity of the findings is questionable as all the reviewed studies were conducted in Western Europe and the USA.

The current review is limited. Meta-analysis could not be undertaken due to substantial heterogeneity across studies in terms of the type of predictors investigated, and the momentary items employed to measure predictors and positive psychotic symptoms. Future reviews should attempt to utilise a meta-analytic approach to permit a precise and numerical estimate of the relationships between momentary social and psychological processes and experiences of positive psychotic symptoms. Additionally, included articles were restricted to those published in peer-reviewed journals. It is possible that unpublished literature may have considered other predictors to those identified through this search. Moreover, due to research with statistically significant effects being increasingly likely to be published, the grey literature may have found many nonsignificant associations that have not been accounted for in the findings of the review. Therefore, caution is recommended in the interpretation of the current findings, and future evidence syntheses should minimise the occurrence of such biases by including grey literature or undertaken formal publication bias analyses to estimate the extent to which these biases affect the findings of the review. Finally, the current review focused solely on positive psychotic symptoms.

Clinical implications and directions for future research

The reviewed literature identifies several social and psychological predictors of momentary positive psychotic symptoms, the most consistent of which are negative affect, cognitive processes and stress sensitivity. It is unclear at present regarding the extent to which these processes are relatively independent from each other, or the temporal order in which such processes may lead to reports of positive psychotic symptoms in daily life, or

whether bidirectional relationships operate moment-to-moment. Further exploration of the pathways between these predictors and psychotic symptoms, including the moderating and mediating effects of predictors, is warranted to test hypothesised mechanisms, disentangle the contribution of these different processes and whether certain triggers or antecedent experiences are particularly likely to “trigger” certain processes,⁸² and support the development of more effective, targeted interventions. This research will require larger sample sizes, longitudinal design, and more complex modelling techniques to allow for the robust appraisal of different pathways from social and psychological predictors to psychosis. It would also be favourable for future ESM studies to utilise the same momentary measures of predictors and psychotic symptoms to facilitate comparison of effect sizes across studies thereby aiding the illumination of these relationships. Additionally, paranoia was the most studied outcome limiting generalisability to other types of positive psychotic experiences; therefore, future ESM studies should attempt to further elucidate associations between psychological and social predictors and other psychotic symptoms in the flow of daily life.

Clinically, it may be useful for interventions for positive psychotic symptoms to incorporate emotion regulation strategies, as developed for use in anxiety disorders and depression⁸³. Furthermore, due to increased stress sensitivity and increases in negative affect resulting in greater psychotic symptoms it may be helpful to identify recurring stress in individuals’ lives to reduce their symptoms. Cognitive behavioural therapy, mindfulness training and stress inoculation techniques⁸⁴ may also equip individuals with stress management skills and aid reduction in psychotic experiences.

Additionally, due to the preliminary but nevertheless consistent evidence regarding the role of cognitive processes being implicated in concurrent and future positive psychotic symptoms, interventions should focus on engagement in these cognitive processes and associated beliefs around the importance of controlling one’s thoughts, avoiding negative mental states and monitoring, ruminating or worrying about one’s thoughts. Metacognitive therapy has been recommended as a method for diminished cognitive processing and attention biases⁸⁵ through Attention Training Techniques,⁸⁶ detached mindfulness or worry reduction techniques^{87,88} to encourage metacognitive control of attention. However, to date metacognitive therapy has not been widely applied to the treatment of psychosis and therefore the evidence as to its clinical utility for psychosis-related difficulties is at its inception.

Clinicians may find it useful to adapt experience sampling methods for use as an adjunct to psychosocial intervention⁸⁹. For example, identifying triggers or antecedents of cognitive processes on a moment-to-moment basis would aid psychological formulation around an individual's psychotic experiences. Moreover, mobile phone-based experience sampling software could be used to administer feedback or instigate a short-individualised strategy when an individual engages in cognitive processes associated with increased symptomatology or when an individual passes a certain symptom or negative affect threshold, to reduce the frequency and impact of positive psychotic experiences⁹⁰.

References

1. DeRosse P, Karlsgodt KH. Examining the psychosis continuum. *Curr Behav Neurosci reports*. 2015;2(2):80-89.
2. Van Os J, Linscott RJ, Myin-Germeys I, Delespaul P, Krabbendam L. A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness–persistence–impairment model of psychotic disorder. *Psychol Med*. 2009;39(2):179-195.
3. Poulton R, Caspi A, Moffitt TE, Cannon M, Murray R, Harrington H. Children’s self-reported psychotic symptoms and adult schizophreniform disorder: a 15-year longitudinal study. *Arch Gen Psychiatry*. 2000;57(11):1053-1058.
4. Tien AY. Distribution of hallucinations in the population. *Soc Psychiatry Psychiatr Epidemiol*. 1991;26(6):287-292.
5. Verdoux H, van Os J. Psychotic symptoms in non-clinical populations and the continuum of psychosis. *Schizophr Res*. 2002;54(1-2):59-65.
6. Bentall RP, Fernyhough C. Social predictors of psychotic experiences: specificity and psychological mechanisms. *Schizophr Bull*. 2008;34(6):1012-1020.
7. Freeman D, Garety P. Helping patients with paranoid and suspicious thoughts: a cognitive–behavioural approach. *Adv Psychiatr Treat*. 2006;12(6):404-415.
8. Trower P, Birchwood M, Meaden A, Byrne S, Nelson A, Ross K. Cognitive therapy for command hallucinations: randomised controlled trial. *Br J Psychiatry*. 2004;184(4):312-320.
9. I. M-G, M. O, D. C, J. L, P. D. Experience sampling research in psychopathology: Opening the black box of daily life. *Psychol Med*. 2009;39(9):1533-1547. doi:<http://dx.doi.org/10.1017/S0033291708004947>
10. J.E. P-C, I. M-G, E. B, et al. Experience sampling research in individuals with mental illness: Reflections and guidance. *ACTA Psychiatr Scand*. 2011;123(1):12-20. doi:<http://dx.doi.org/10.1111/j.1600-0447.2010.01596.x>
11. Morrison AP. The interpretation of intrusions in psychosis: an integrative cognitive approach to hallucinations and delusions. *Behav Cogn Psychother*. 2001;29(3):257-276.
12. Garety PA, Kuipers E, Fowler D, Freeman D, Bebbington PE. A cognitive model of the positive symptoms of psychosis. *Psychol Med*. 2001;31(2):189-195.
13. Freeman D, Garety PA, Kuipers E, Fowler D, Bebbington PE. A cognitive model of persecutory delusions. *Br J Clin Psychol*. 2002;41(4):331-347.
14. Steel C, Fowler D, Holmes EA. Trauma-related intrusions and psychosis: an information processing account. *Behav Cogn Psychother*. 2005;33(2):139-152.
15. Bentall RP, Corcoran R, Howard R, Blackwood N, Kinderman P. Persecutory delusions: a review and theoretical integration. *Clin Psychol Rev*. 2001;21(8):1143-1192.
16. Lobban F, Barrowclough C. An Interpersonal CBT Framework for Involving Relatives in Interventions for Psychosis: Evidence Base and Clinical Implications. *Cognit Ther Res*. 2016;40:198-215. doi:10.1007/s10608-015-9731-3
17. M. C. Validity and reliability of the experience-sampling method. *J Nerv Ment Dis*. 1987;175(9):526-536. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed3&NEWS=N&AN=17144371>.
18. Myin-Germeys I, Delespaul P, van Os J, I. M-G, P. D. The Experience Sampling Method in psychosis research. *Curr Opin Psychiatry*. 2003;16(SUPPL. 2):S33-S38. doi:10.1097/00001504-200304002-00006

19. M. O, T. K, P. D. Momentary Assessment Research in Psychosis. *Psychol Assess.* 2009;21(4):498-505. doi:http://dx.doi.org/10.1037/a0017077
20. D. K, I. M-G, J. P-C. Mobile assessment guide for research in schizophrenia and severe mental disorders. *Schizophr Bull.* 2012;38(3):386-395. doi:http://dx.doi.org/10.1093/schbul/sbr186
21. Scollon CN, Prieto C-K, Diener E. Experience sampling: promises and pitfalls, strength and weaknesses. In: *Assessing Well-Being.* Springer; 2009:157-180.
22. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med.* 2009;151(4):264-269.
23. Harvey AG, Watkins E. *Cognitive Behavioural Processes across Psychological Disorders: A Transdiagnostic Approach to Research and Treatment.* Oxford University Press, USA; 2004.
24. Landis JR, Koch GG. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics.* 1977:363-374.
25. Plassman BL, Williams JW, Burke JR, Holsinger T, Benjamin S. Systematic review: factors associated with risk for and possible prevention of cognitive decline in later life. *Ann Intern Med.* 2010;153(3):182-193.
26. Dudley R, Taylor P, Wickham S, Hutton P. Psychosis, delusions and the “jumping to conclusions” reasoning bias: a systematic review and meta-analysis. *Schizophr Bull.* 2015;42(3):652-665.
27. Taylor PJ, Hutton P, Wood L. Are people at risk of psychosis also at risk of suicide and self-harm? A systematic review and meta-analysis. *Psychol Med.* 2015;45(5):911-926.
28. Collip D, Wigman JTW, Myin-Germeys I, et al. From Epidemiology to Daily Life: Linking Daily Life Stress Reactivity to Persistence of Psychotic Experiences in a Longitudinal General Population Study. *PLoS One.* 2013;8(4). doi:10.1371/journal.pone.0062688
29. Kramer I, Simons CJP, Wigman JTW, et al. Time-Lagged Moment-to-Moment Interplay Between Negative Affect and Paranoia: New Insights in the Affective Pathway to Psychosis. *Schizophr Bull.* 2014;40(2):278-286. doi:10.1093/schbul/sbs194
30. Little RJA. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc.* 1988;83(404):1198-1202.
31. Carter L-A, Emsley R. The analysis of experience sampling data. *Exp Sampl Ment Heal Res.* 2019.
32. D. B-Z, K. E, J. S. Examining a cognitive model of persecutory ideation in the daily life of people with schizophrenia: A computerized experience sampling study. *Schizophr Bull.* 2011;37(6):1248-1256. doi:http://dx.doi.org/10.1093/schbul/sbq041
33. Nittel CM suppression is associated with state paranoia in psychosis: A experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia, Lincoln TM, Lamster F, et al. Expressive suppression is associated with state paranoia in psychosis: An experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia. *Br J Clin Psychol.* 2018;57(3):291-312. doi:10.1111/bjc.12174
34. Peters E, Lataster T, Greenwood K, et al. Appraisals, psychotic symptoms and affect in daily life. *Psychol Med.* 2012;42(5):1013-1023. doi:http://dx.doi.org/10.1017/S0033291711001802
35. V. T, R.P. B, M. O, J. AC, T. van L, J. van O. Emotions, self-esteem, and paranoid

- episodes: an experience sampling study. *Br J Clin Psychol*. 2011;50(2):178-195. doi:http://dx.doi.org/10.1348/014466510X508677
36. Wigman JTW, van Os J, Borsboom D, et al. Exploring the underlying structure of mental disorders: cross-diagnostic differences and similarities from a network perspective using both a top-down and a bottom-up approach. *Psychol Med*. 2015;45(11):2375-2387. doi:http://dx.doi.org/10.1017/S0033291715000331
 37. D. B-Z, R. F, S.B. M. self-stigma. *J Dual Diagn*. 2012;8(4):305-314. doi:http://dx.doi.org/10.1080/15504263.2012.723311
 38. Ben-Zeev D, Morris S, Swendsen J, Granholm E. Predicting the Occurrence, Conviction, Distress, and Disruption of Different Delusional Experiences in the Daily Life of People with Schizophrenia. *Schizophr Bull*. 2012;38(4):826-837. doi:10.1093/schbul/sbq167
 39. S.H.-W. S, A.K.C. C, E.R. P, J. S, P.A. G. Moment-to-moment associations between negative affect, aberrant salience, and paranoia. *Cogn Neuropsychiatry*. 2018;23(5):299-306. doi:http://dx.doi.org/10.1080/13546805.2018.1503080
 40. Klippel A. Modelling the Interplay Between Psychological Processes and Adverse, Stressful Contexts and Experiences in Pathways to Psychosis: An Experience Sampling Study (vol 43, pg 302, 2017). *Schizophr Bull*. 2018;44(5):1159-1165. doi:10.1093/schbul/sby068
 41. Klippel A, Viechtbauer W, Reininghaus U, et al. The Cascade of Stress: A Network Approach to Explore Differential Dynamics in Populations Varying in Risk for Psychosis. *Schizophr Bull*. 2018;44(2):328-337. doi:10.1093/schbul/sbx037
 42. K. K, B. S, Lincoln T. AO - Krkovic KO http://orcid.org/000.-0002-1961-9810. An experience sampling study on the nature of the interaction between traumatic experiences, negative affect in everyday life, and threat beliefs. *Schizophr Res*. 2018;201:381-387. doi:http://dx.doi.org/10.1016/j.schres.2018.05.030
 43. K. K, S. K, Lincoln T.M. AO - Krkovic KO http://orcid.org/000.-0002-1961-9810. Emotion regulation as a moderator of the interplay between self-reported and physiological stress and paranoia. *Eur Psychiatry*. 2018;49:43-49. doi:http://dx.doi.org/10.1016/j.eurpsy.2017.12.002
 44. Ludtke T, Kriston L, Schroder J, et al. Negative affect and a fluctuating jumping to conclusions bias predict subsequent paranoia in daily life: An online experience sampling study. *J Behav Ther Exp Psychiatry*. 2017;56(SI):106-112. doi:http://dx.doi.org/10.1016/j.jbtep.2016.08.014
 45. Buckley PF, Miller BJ, Lehrer DS, Castle DJ. Psychiatric comorbidities and schizophrenia. *Schizophr Bull*. 2008;35(2):383-402.
 46. van Rossum I, Dominguez M-G, Lieb R, Wittchen H-U, van Os J. Affective dysregulation and reality distortion: a 10-year prospective study of their association and clinical relevance. *Schizophr Bull*. 2009;37(3):561-571.
 47. Varese F, Udachina A, Myin-Germeys I, Oorschot M, Bentall RP. The relationship between dissociation and auditory verbal hallucinations in the flow of daily life of patients with psychosis. *PSYCHOSIS-PSYCHOLOGICAL Soc Integr APPROACHES*. 2011;3(1):14-28. doi:10.1080/17522439.2010.548564
 48. Hartley S, Haddock G, e Sa D, et al. An experience sampling study of worry and rumination in psychosis. *Psychol Med*. 2014;44(8):1605-1614. doi:10.1017/S0033291713002080
 49. Hartley S, Haddock G, e Sa D, Emsley R, Barrowclough C. The influence of thought control on the experience of persecutory delusions and auditory hallucinations in daily life. *Behav Res Ther*. 2015;65:1-4. doi:10.1016/j.brat.2014.12.002
 50. Palmier-Claus JE, Dunn G, Taylor H, et al. Cognitive-self consciousness and

- metacognitive beliefs: Stress sensitization in individuals at ultra-high risk of developing psychosis. *Br J Clin Psychol*. 2013;52(1):26-41. doi:10.1111/j.2044-8260.2012.02043.x
51. U. R, M.J. K, L. V, et al. Stress sensitivity, aberrant salience, and threat anticipation in early psychosis: An experience sampling study. *Schizophr Bull*. 2016;42(3):712-722. doi:http://dx.doi.org/10.1093/schbul/sbv190
 52. A. U, V. T, I. M-G, S. F, A. O. Understanding the relationships between self-esteem, experiential avoidance, and paranoia: Structural equation modelling and experience sampling studies. *J Nerv Ment Dis*. 2009;197(9):661-668. doi:http://dx.doi.org/10.1097/NMD.0b013e3181b3b2ef
 53. A. U, F. V, I. M-G. The role of experiential avoidance in paranoid delusions: an experience sampling study. *Br J Clin Psychol*. 2014;53(4):422-432. doi:http://dx.doi.org/10.1111/bjc.12054
 54. Hayes SC, Strosahl K, Wilson KG, et al. Measuring experiential avoidance: A preliminary test of a working model. *Psychol Rec*. 2004;54(4):553-578.
 55. Kapur S. Psychosis as a state of aberrant salience: a framework linking biology, phenomenology, and pharmacology in schizophrenia. *Am J Psychiatry*. 2003;160(1):13-23.
 56. Freeman D, Garety PA. Worry, worry processes and dimensions of delusions: an exploratory investigation of a role for anxiety processes in the maintenance of delusional distress. *Behav Cogn Psychother*. 1999;27(1):47-62.
 57. Jones SR, Fernyhough C. Rumination, reflection, intrusive thoughts, and hallucination-proneness: towards a new model. *Behav Res Ther*. 2009;47(1):54-59.
 58. I. M-G, Ph. D, Myin-Germeys I, Delespaul P, van Os J. Behavioural sensitization to daily life stress in psychosis. *Psychol Med*. 2005;35(5):733-741. doi:10.1017/S0033291704004179
 59. Huq SF, Garety PA, Hemsley DR. Probabilistic judgements in deluded and non-deluded subjects. *Q J Exp Psychol Sect A*. 1988;40(4):801-812.
 60. Collip I, Oorschot M, Thewissen V, et al. Social world interactions: how company connects to paranoia. *Psychol Med*. 2011;41(5):911-921. doi:10.1017/S0033291710001558
 61. Lardinois M, Lataster T, Mengelers R, et al. Childhood trauma and increased stress sensitivity in psychosis. *ACTA Psychiatr Scand*. 2011;123(1):28-35. doi:http://dx.doi.org/10.1111/j.1600-0447.2010.01594.x
 62. Palmier-Claus JE, Dunn G, Lewis SW, J.E. P-C, G. D. Emotional and symptomatic reactivity to stress in individuals at ultra-high risk of developing psychosis. *Psychol Med*. 2012;42(5):1003-1012. doi:http://dx.doi.org/10.1017/S0033291711001929
 63. Weijers J, Viechtbauer W, Eurelings-Bontekoe E, Selten J-P. Reported Childhood Abuse and Stress Reactivity in Psychosis: A Conceptual Replication and Exploration of Statistical Approaches. *Front PSYCHIATRY*. 2018;9. doi:10.3389/fpsy.2018.00639
 64. Barrantes-Vidal N, Chun CA, Myin-Germeys I, Kwapil TR. Psychometric Schizotypy Predicts Psychotic-Like, Paranoid, and Negative Symptoms in Daily Life. *J Abnorm Psychol*. 2013;122(4):1077-1087. doi:10.1037/a0034793
 65. P. C-N, T. S, S. B, M. M, I. M-G, T.R. K. Impact of Adverse Childhood Experiences on Psychotic-Like Symptoms and Stress Reactivity in Daily Life in Nonclinical Young Adults. *PLoS One*. 2016;11(4):e0153557. doi:http://dx.doi.org/10.1371/journal.pone.0153557
 66. I. M-G, N.A. N, Myin-Germeys I, Nicolson NA, Delespaul P. The context of delusional experiences in the daily life of patients with schizophrenia. *Psychol Med*. 2001;31(3):489-498.

<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed7&NEWS=N&AN=32294047>.

67. H. V, M. H, M. T, et al. Social environments and daily life occurrence of psychotic symptoms - An experience sampling test in a non-clinical population. *Soc Psychiatry Psychiatr Epidemiol*. 2003;38(11):654-661. doi:10.1007/s00127-003-0702-8
68. Vasconcelos E Sa D, Wearden A, Hartley S, et al. Expressed Emotion and behaviourally controlling interactions in the daily life of dyads experiencing psychosis. *Psychiatry Res*. 2016;245:406-413. doi:<http://dx.doi.org/10.1016/j.psychres.2016.08.060>
69. Sitko K, Varese F, Sellwood W, Hammond A, Bentall R. The dynamics of attachment insecurity and paranoid thoughts: An experience sampling study. *PSYCHIATRY Res*. 2016;246:32-38. doi:10.1016/j.psychres.2016.08.057
70. V. T, R.P. B, T. L, J. van O. Fluctuations in Self-Esteem and Paranoia in the Context of Daily Life. *J Abnorm Psychol*. 2008;117(1):143-153. doi:<http://dx.doi.org/10.1037/0021-843X.117.1.143>
71. Freeman D, Garety PA. Connecting neurosis and psychosis: the direct influence of emotion on delusions and hallucinations. *Behav Res Ther*. 2003;41(8):923-947.
72. Berry K, Bucci S. What does attachment theory tell us about working with distressing voices? *Psychosis*. 2016;8(1):60-71.
73. N. B, R. E, F. L, <http://orcid.org/0000-0001-6594-4350> BSAO-BN. O <http://orcid.org/000.-0001-7414-1541> AO-BS. O <http://orcid.org/000.-0002-6197-5333> AO-ER. O <http://orcid.org/000.-0002-1218-675X> AO-LF. O. Social media and its relationship with mood, self-esteem and paranoia in psychosis. *Acta Psychiatr Scand*. 2018;138(6):558-570. doi:<http://dx.doi.org/10.1111/acps.12953>
74. I. M-G. Stress-reactivity in psychosis: Evidence for an affective pathway to psychosis. *Clin Psychol Rev*. 2007;27(4):409-424. doi:<http://dx.doi.org/10.1016/j.cpr.2006.09.005>
75. Zubin J, Spring B. Vulnerability: a new view of schizophrenia. *J Abnorm Psychol*. 1977;86(2):103.
76. Faight B, Colby KM, Parkison RC. *The Interaction of Inferences, Affects, and Intentions, in a Model of Paranoia*. STANFORD UNIV CA DEPT OF COMPUTER SCIENCE; 1974.
77. Melo SS, Taylor JL, Bentall RP. Poor me versus bad me paranoia and the instability of persecutory ideation. *Psychol Psychother Theory, Res Pract*. 2006;79(2):271-287.
78. Thewissen V, Myin-Germeys I, Bentall R, de Graaf R, Vollebergh W, van Os J. Instability in self-esteem and paranoia in a general population sample. *Soc Psychiatry Psychiatr Epidemiol*. 2007;42(1):1-5.
79. Hoertel N, Le Strat Y, Lavaud P, Dubertret C, Limosin F. Generalizability of clinical trial results for bipolar disorder to community samples: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2013.
80. Sears DO. College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *J Pers Soc Psychol*. 1986;51(3):515.
81. Van Lange PAM, Schippers M, Balliet D. Who volunteers in psychology experiments? An empirical review of prosocial motivation in volunteering. *Pers Individ Dif*. 2011;51(3):279-284.
82. Bentall RP, de Sousa P, Varese F, et al. From adversity to psychosis: pathways and mechanisms from specific adversities to specific symptoms. *Soc Psychiatry Psychiatr Epidemiol*. 2014;49(7):1011-1022.
83. Barlow DH, Allen LB, Choate ML. Toward a unified treatment for emotional

- disorders. *Behav Ther.* 2004;35(2):205-230.
84. Meichenbaum DH, Deffenbacher JL. Stress inoculation training. *Couns Psychol.* 1988;16(1):69-90.
 85. Wells A, Fisher P, Myers S, Wheatley J, Patel T, Brewin CR. Metacognitive therapy in recurrent and persistent depression: A multiple-baseline study of a new treatment. *Cognit Ther Res.* 2009;33(3):291-300.
 86. Wells A. A metacognitive model and therapy for generalized anxiety disorder. *Clin Psychol Psychother An Int J Theory Pract.* 1999;6(2):86-95.
 87. Wells A. Detached mindfulness in cognitive therapy: A metacognitive analysis and ten techniques. *J Ration Cogn Ther.* 2005;23(4):337-355.
 88. Wells A, Matthews G. Modelling cognition in emotional disorder: The S-REF model. *Behav Res Ther.* 1996;34(11-12):881-888.
 89. Myin-Germeys I, Birchwood M, Kwapil T. From Environment to Therapy in Psychosis: A Real-World Momentary Assessment Approach. *Schizophr Bull.* 2011;37(2):244-247. doi:10.1093/schbul/sbq164
 90. E. G, D. B-Z, P.C. L, K.R. B. Mobile assessment and treatment for schizophrenia (MATS): A pilot trial of an interactive text-messaging intervention for medication adherence, socialization, and auditory hallucinations. *Schizophr Bull.* 2012;38(3):414-425. doi:http://dx.doi.org/10.1093/schbul/sbr155
 91. Fenigstein A, Levine MP. Self-attention, concept activation, and the causal self. *J Exp Soc Psychol.* 1984;20(3):231-245.
 92. Moutoussis M, Williams J, Dayan P, Bentall RP. Persecutory delusions and the conditioned avoidance paradigm: towards an integration of the psychology and biology of paranoia. *Cogn Neuropsychiatry.* 2007;12(6):495-510.
 93. Freeman D, Garety P. Advances in understanding and treating persecutory delusions: a review. *Soc Psychiatry Psychiatr Epidemiol.* 2014;49(8):1179-1189.
 94. Van Os J, Verdoux H, Maurice-Tison S, et al. Self-reported psychosis-like symptoms and the continuum of psychosis. *Soc Psychiatry Psychiatr Epidemiol.* 1999;34(9):459-463.
 95. Bowlby J. Attachment And Loss. Vol. 2: Separation: Anxiety And An: Evt. 1973.
 96. Berry K, Band R, Corcoran R, Barrowclough C, Wearden A. Attachment styles, earlier interpersonal relationships and schizotypy in a non-clinical sample. *Psychol Psychother Theory, Res Pract.* 2007;80(4):563-576.
 97. Main M, Kaplan N, Cassidy J. Security in infancy, childhood, and adulthood: A move to the level of representation. *Monogr Soc Res child Dev.* 1985.
 98. Ainsworth MDS, Blehar M, Waters E, Wall S. Patterns of attachment: Observations in the Strange Situation and at home. *Hillsdale, NJ Erlbaum.* 1978.
 99. Hazan C, Shaver P. Romantic love conceptualized as an attachment process. *J Pers Soc Psychol.* 1987;52(3):511.
 100. Mikulincer M, Shaver PR, Pereg D. Attachment Theory and Affect Regulation: The Dynamics, Development, and Cognitive Consequences of Attachment-Related Strategies. *Motiv Emot.* 2003;27(2):77-102. doi:10.1023/A:1024515519160
 101. Mikulincer M, Shaver PR, Bar-On N, Ein-Dor T. The pushes and pulls of close relationships: Attachment insecurities and relational ambivalence. *J Pers Soc Psychol.* 2010;98(3):450.
 102. Purnell C. Childhood trauma and adult attachment. *Healthc Couns Psychother J.* 2010;10(2):1-7.
 103. Wickham S, Sitko K, Bentall RP. Insecure attachment is associated with paranoia but not hallucinations in psychotic patients: the mediating role of negative self-esteem. *Psychol Med.* 2015;45(7):1495-1507.
 104. Pickering L, Simpson J, Bentall RP. Insecure attachment predicts proneness to

- paranoia but not hallucinations. *Pers Individ Dif*. 2008;44(5):1212-1224.
105. Pierce T, Lydon JE. Global and specific relational models in the experience of social interactions. *J Pers Soc Psychol*. 2001;80(4):613.
 106. Scharfe E, Bartholomew KIM. Reliability and stability of adult attachment patterns. *Pers Relatsh*. 1994;1(1):23-43.
 107. Waters E, Merrick S, Treboux D, Crowell J, Albersheim L. Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Dev*. 2000;71(3):684-689.
 108. Baldwin MW, Fehr B. On the instability of attachment style ratings. *Pers Relatsh*. 1995;2(3):247-261.
 109. Csikszentmihalyi M, Larson R. Validity and reliability of the experience-sampling method. In: *Flow and the Foundations of Positive Psychology*. Springer; 2014:35-54.
 110. Freeman D, Evans N, Lister R, Antley A, Dunn G, Slater M. Height, social comparison, and paranoia: an immersive virtual reality experimental study. *Psychiatry Res*. 2014;218(3):348-352.
 111. Wei M, Russell DW, Mallinckrodt B, Vogel DL. The Experiences in Close Relationship Scale (ECR)-short form: Reliability, validity, and factor structure. *J Pers Assess*. 2007;88(2):187-204.
 112. Trinke SJ, Bartholomew K. Hierarchies of attachment relationships in young adulthood. *J Soc Pers Relat*. 1997;14(5):603-625.
 113. Doherty NA, Feeney JA. The composition of attachment networks throughout the adult years. *Pers Relatsh*. 2004;11(4):469-488.
 114. Fenigstein A, Vanable PA. Paranoia and self-consciousness. *J Pers Soc Psychol*. 1992;62(1):129.
 115. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther*. 1995;33(3):335-343.
 116. Allan S, Gilbert P. A social comparison scale: Psychometric properties and relationship to psychopathology. *Pers Individ Dif*. 1995;19(3):293-299.
 117. Snijders TAB, Bosker RJ. An introduction to basic and advanced multilevel modeling. *Sage, London WONG, GY, y MASON, WM Hierarchical Logist Regression Model Multilevel Anal J Am Stat Assoc*. 1999;80(5):13-524.
 118. Snijders T. Longitudinal data. In «Multilevel analysis: An introduction to basic and advanced multilevel modeling. Ed Snijders and Bosker. 166-200. 2003.
 119. Kreft IGG. Are multilevel techniques necessary? An overview, including simulation studies. *Unpubl manuscript, Calif State Univ Los Angeles*. 1996.
 120. Kwok O-M, Underhill AT, Berry JW, Luo W, Elliott TR, Yoon M. Analyzing longitudinal data with multilevel models: An example with individuals living with lower extremity intra-articular fractures. *Rehabil Psychol*. 2008;53(3):370.
 121. StataCorp LP. STATA 12 [Computer software]. *Coll Station TX StataCorp LP*. 2015.
 122. Hox JJ, Moerbeek M, Van de Schoot R. *Multilevel Analysis: Techniques and Applications*. Routledge; 2017.
 123. Schwartz JE, Stone AA. Strategies for analyzing ecological momentary assessment data. *Heal Psychol*. 1998;17(1):6.
 124. Tabachnick BG, Fidell LS. *Using multivariate statistics* Boston. MA Allyn Bacon. 2007;5:2007.
 125. Höhn P, Menne-Lothmann C, Peeters F, et al. Moment-to-Moment Transfer of Positive Emotions in Daily Life Predicts Future Course of Depression in Both General Population and Patient Samples. *PLoS One*. 2013;8(9).

- doi:10.1371/journal.pone.0075655
126. Watson D, Clark LA. Measurement and Mismeasurement of Mood: Recurrent and Emergent issues. *J Pers Assess.* 1997;68(2):267-296.
doi:10.1207/s15327752jpa6802_4
 127. Schmukle SC, Egloff B, Burns LR. The relationship between positive and negative affect in the Positive and Negative Affect Schedule. *J Res Pers.* 2002;36(5):463-475.
 128. Diener E, Emmons RA. The independence of positive and negative affect. *J Pers Soc Psychol.* 1984;47(5):1105.
 129. Ainsworth MD, Wittig B. Attachment, exploration, and separation: illustrated by the behavior of one-year-olds in a strange situation. *Determ infant Behav.* 1969;4:113-136.
 130. Mikulincer M, Shaver P. Mental representations and attachment security. *Interpers Cogn.* 2005:233-266.
 131. Collins NL, Allard LM. Cognitive representations of attachment: The content and function of working models. *Blackwell Handb Soc Psychol Interpers Process.* 2001;2:60-85.
 132. Collins NL, Read SJ. Cognitive representations of attachment: The structure and function of working models. 1994.
 133. Mikulincer M, SHAVER PR. An attachment perspective on psychopathology. *World Psychiatry.* 2012;11(1):11-15.
 134. Garety P, Waller H, Emsley R, et al. Cognitive mechanisms of change in delusions: an experimental investigation targeting reasoning to effect change in paranoia. *Schizophr Bull.* 2014;41(2):400-410.
 135. Plotka R. Adult Attachment Interview (AAI). *Encycl Child Behav Dev.* 2011:52-54.
 136. George C, Kaplan N, Main M. Attachment interview for adults. *Unpubl manuscript, Univ California, Berkeley.* 1985.
 137. Huddy V. The Assessment and Modeling of Perceptual Control A Transformation in Research Methodology to Address the Replication Crisis Warren Mansell School of Health Sciences, University of Manchester, UK. 2018.
 138. Carey TA, Tai SJ, Mansell W, Huddy V, Griffiths R, Marken RS. Improving professional psychological practice through an increased repertoire of research methodologies: Illustrated by the development of MOL. *Prof Psychol Res Pract.* 2017;48(3):175.
 139. Palmier-Claus JE, Rogers A, Ainsworth J, et al. Integrating mobile-phone based assessment for psychosis into people's everyday lives and clinical care: a qualitative study. *BMC Psychiatry.* 2013;13(1):34.
 140. Bucci S, Barrowclough C, Ainsworth J, et al. Actissist: proof-of-concept trial of a theory-driven digital intervention for psychosis. *Schizophr Bull.* 2018;44(5):1070-1080.
 141. Myin-Germeys I, Delespaul PAEG, van Os J, I. M-G, P.A.E.G. D. Experience sampling research in psychosis. A review. Aleman Appelo, Barge-Schaapveld, Barge-Schaapveld, Bebbington, Berenbaum, Brett Jones, Cannon, Clark, Csikszentmihalyi, Debowska, Delespaul, Delespaul, Dijkman-Caes, Fowler, Garety, Hammen, Heinrichs, Herbener, Krabbendam, Krmg, Larson, Lukoff, Mohamed, A, ed. *Tijdschr Psychiatr.* 2003;45(3):131-140.
<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=36323604>.
 142. Rosenthal R. The file drawer problem and tolerance for null results. *Psychol Bull.* 1979;86(3):638.
 143. Hopewell S, Clarke M, Askie L. Reporting of trials presented in conference

- abstracts needs to be improved. *J Clin Epidemiol*. 2006;59(7):681-684.
144. Jadad AR, Moher M, Browman GP, et al. Systematic reviews and meta-analyses on treatment of asthma: critical evaluation. *Bmj*. 2000;320(7234):537-540.
 145. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med*. 2009;6(7):e1000100.
 146. Greenland S. Invited commentary: a critical look at some popular meta-analytic methods. *Am J Epidemiol*. 1994;140(3):290-296.
 147. Blundell M. Understanding and synthesizing my numerical data. *Doing a Syst Rev student's Guid Los Angeles Sage*. 2014.
 148. Bentall RP, Varese F. A level playing field?: Are bio-genetic and psychosocial studies evaluated by the same standards? 2012.
 149. Rainie L, Zickuhr K, Purcell K, Madden M, Brenner J. The Rise of E-Reading. *Pew Internet Am Life Proj*. 2012.
 150. Coyne SM, Stockdale L, Busby D, Iverson B, Grant DM. "I luv u:!)": A descriptive study of the media use of individuals in romantic relationships. *Fam Relat*. 2011;60(2):150-162.
 151. Morey JN, Gentzler AL, Creasy B, Oberhauser AM, Westerman D. Young adults' use of communication technology within their romantic relationships and associations with attachment style. *Comput Human Behav*. 2013;29(4):1771-1778.
 152. Bartholomew K, Horowitz LM. Attachment styles among young adults: a test of a four-category model. *J Pers Soc Psychol*. 1991;61(2):226.
 153. Brennan KA, Clark CL, Shaver PR. Self-report measurement of adult attachment: An integrative overview. 1998.
 154. Fernandez C V, Kodish E, Weijer C. Informing study participants of research results: an ethical imperative. *IRB Ethics Hum Res*. 2003;25(3):12-19.

Table 1: Overview of studies included in review

Author, Year & Country	Sample size	Diagnosis	n (F:M)	Mean age	ESM assessment period	Momentary predictor(s)	Momentary outcome(s)
Barrantes-Vidal et al. (2013) ^a Spain	206	Non-clinical	163 F: 43 M	19.8	8 prompts per day, over 7 days	Situational stress Social stress Social contact	Psychosis-like experiences Paranoia
Ben-Zeev et al. (2011) USA	145	Schizophrenia Schizoaffective disorder	56 F: 89 M	46.5	4 prompts per day, over 7 days	Anxiety Sadness External events (housing/finance; work/education; family or friend relationships; interactions with strangers; other)	Persecutory ideation
Ben-Zeev et al. (2012a) USA	24	Schizophrenia Schizoaffective disorder	7 F: 17 M	44.9	6 prompts per day, over 7 days	Positive affect Negative affect Self-stigma	Psychotic symptoms
Ben-Zeev et al. (2012b) USA	130	Schizophrenia Schizoaffective disorder	53 F:77 M	46.2	4 prompts per day, over 7 days	Sadness Anxiety	Delusions (regardless of type) Delusions of control Delusions of reference Delusions of grandiosity Paranoia
Berry et al. (2018). UK	44	FEP(n=9) Schizophrenia(n=3) Schizoaffective disorder(n=4) Paranoid schizophrenia(n=2) Psychosis disorder NOS(n=1) 25 Healthy controls	26 F: 18 M	Patients: 33.7 Controls: 35.4	6 prompts per day, over 6 days	Social media use Social rank Social-media activities	Paranoia
Collip et al (2011) ^{b d g} Netherlands	154	30 currently paranoid patients; 34 currently non-paranoid patients; 15 remitted patients (diagnoses in these groups included psychotic disorder, schizoaffective disorder) 38 High schizotypy participants 37 Healthy controls	61 F: 93 M	Current paranoid patients: 38 Current non-paranoid patients: 36 Remitted patients: 33 High schizotypy:	10 prompts per day, over 6 days	Event-related stress Social company	Paranoia

				47.0 Controls: 48.0			
Collip et al (2013) Netherlands	529	Non-clinical	529 F: 0 M	27.2	10 prompts per day, over 5 days	Activity-related stress	Paranoia
Cristóbal-Narváez et al. (2015) ^a Spain	206	Non-clinical	162 F: 44 M	21.3	8 prompts per day, over 7 days	Situational stress Social stress Social contact	Paranoia Psychotic-like symptoms
Hartley et al. (2014) ^c UK	32	Schizophrenia(n= 15) Psychotic disorder NOS(n=14) Schizoaffective disorder(n=2) Acute psychotic disorder(n=1)	10 F: 22 M	33.0	10 prompts per day, over 6 days	Worry Rumination	Auditory hallucinations Persecutory delusions
Hartley et al. (2015) ^c UK	32	Schizophrenia(n=15) Psychotic disorder NOS(n=14) Schizoaffective disorder(n=2) Acute psychotic disorder(n=1)	10 F: 22 M	33.0	10 prompts per day, over 6 days	Thought control	Auditory hallucinations Persecutory delusions
Ho-Wai So et al. (2018) UK	14	Schizophrenia spectrum or other psychotic disorder who were currently experiencing persecutory delusions	6 F: 8 M	34.1	7 prompts per day, over 14 days	Negative Affect Aberrant Salience	Paranoia
Klippel et al. (2018a) Netherlands	150	FEP(n=51) ARMS(n=46) 53 Healthy controls	76 F :74 M	FEP: 28.3 ARMS: 23.6 Controls: 35.0	10 prompts per day, over 6 days	Event-related stress Activity-related stress Social stress Negative affect Threat anticipation	Psychotic experiences
Klippel et al. (2018b) ^{d *} Netherlands	654	Psychotic patients (n=245) First-degree relatives of psychotic patients(n=165) 244 Healthy controls	361F:290 M 3 participants did not specify gender	Patients: 35.3 First-degree relatives: 36.8 Controls: 36.5	10 prompts per day, over 5 days or 10 prompts per day, over 6 days	Affect (relaxed) Event-related stress Being alone	Psychotic experiences
Kramer et al. (2014) Belgium	515	Non-clinical	515 F: 0 M	27.7	10 prompts per day, over 5 days	Negative affect	Paranoia

Krkovic et al. (2018a) ^e Germany	67	Non-clinical	48 F: 19 M	23.0	38 prompts over 1 day	Negative affect	Paranoia
Krkovic et al. (2018b) ^e Germany	67	Non-clinical	48 F: 19 M	23.0	38 prompts over 1 day	Stress	Paranoia
Lardinois et al. (2011) Netherlands	50	Schizophrenia(n=31) Schizoaffective disorder(n=7) Schizophreniform disorder(n=1) Brief psychotic disorder(n=1) Delusional disorder(n=2) Psychotic disorder NOS(n=8)	15 F: 35 M	26.2	10 prompts per day, over 6 days	Event-related stress Activity-related stress	Psychosis
Lüdtke et al. (2017) Germany	35	Schizophrenia spectrum disorders	19 F: 16 M	39.0	4 prompts, over 2 days	Jumping to conclusions bias Negative affect	Paranoia
Myin-Germeys et al. (2001) ^{d g} Netherlands	48	Schizophrenia	20 F: 28 M	35.0	10 prompts per day, over 6 days	Type of activity Change in activity Familiarity of persons currently present Change in company	Delusions
Nittel et al. (2018) Germany	32	Schizophrenia(n=23) Schizoaffective disorder(n=7) Schizotypal personality disorder(n=1) Delusional disorder(n=1)	18 F: 14 M	35.9	10 prompts per day, over 6 days	Negative affect Emotional instability	Paranoia
Palmier-Claus et al. (2012) ^f UK	54	UHR(n=27) Non-affective psychosis(n=27)	19 F: 35 M	Patients: 33.2 UHR: 22:6	10 prompts per day, over 6 days	Activity-related stress Social stress Event-related stress	Hallucinations Delusional/dissociative thinking
Palmier-Claus et al. (2013) ^f UK	27	UHR	13 F: 14 M	22.6	10 prompts per day, over 6 days	Cognitive self-consciousness Activity-related stress Social stress Event-related stress	Hallucinations Delusional/dissociative thinking
Peters et al. (2011) UK	12	Patients with psychosis	7 F: 5 M	36.4	10 prompts per day, over 6 days	Positive affect Negative affect	Auditory Hallucinations Delusions
Reininghaus et al. (2016) UK	150	FEP(n=51) ARMS(n=46) 53 Healthy controls	76 F :74 M	FEP: 28.3 ARMS: 23.6	10 prompts per day, over 6 days	Event-related stress Activity-related stress Social stress	Psychotic experiences

				Controls: 35.0		Social disconnectedness Area-related stress Aberrant salience Threat anticipation	
Sitko et al. (2016) UK	40	Schizophrenia spectrum diagnosis (n=20) 20 Healthy controls	9 F: 31 M	Patients: 41.1 Controls: 35.1	10 prompts per day, over 6 days	Attachment insecurity Self-esteem	Paranoia Auditory hallucinations
Thewissen et al.(2008) ^{b d g} Netherlands	154	30 Currently paranoid patients; 34 Currently non- paranoid patients; 15 Remitted patients (diagnoses in these groups included psychotic disorder, schizoaffective disorder) 38 High schizotypy participants 37 Healthy controls	61 F: 93 M	Current paranoid patients: 38:1 Current non- paranoid patients: 36 Remitted patients: 32.5 High schizotypy: 47.3 Controls: 48.7	10 prompts per day, over 6 days	Change in self-esteem defined as the difference in self-esteem between two succeeding reports: the self-esteem score on the previous moment (t-1) minus the self-esteem score on the target moment (t)	Paranoia
Thewissen et al. (2011) ^b Netherlands	158	33 Currently paranoid patients; 34 Currently non- paranoid patients; 15 Remitted patients (diagnoses in these groups included psychotic disorder, schizoaffective disorder) 39 High schizotypy participants 37 Healthy controls	64 F: 94 M	Current paranoid patients: 38:7 Current non- paranoid patients: 36 Remitted patients: 32.5 High schizotypy: 47.4 Controls: 48.7	10 prompts per day, over 6 days	Emotional experiences (anxiety; anger/irritability; down) Self-esteem	Paranoia
Udachina et al. (2009) UK	427	Non-clinical	306 F: 94 M 27 unidentified gender	21.7	10 prompts per day, over 6 days	Negative self-esteem Positive self-esteem Experiential avoidance	Paranoia
Udachina et al. (2014) UK	41	Schizophrenia, schizoaffective or delusional disorder who	17 F: 24 M	40.2	10 prompts per day, over 6 days	Experiential Avoidance Self-esteem	Paranoia

		ranged across the continuum of paranoia							
Varese et al. (2011) UK	65	Schizophrenia(n=34) Schizoaffective(n=7) Delusional disorder(n=1) 23 Healthy controls	27 F:38 M	Patients: 40.1 Controls: 37.8	10 prompts per day, over 6 days	Dissociation Experiential avoidance		Auditory hallucinations	
Vasconcelos e Sa et al (2016) UK	42	FEP(n=7) Schizophrenia(n=8) Schizoaffective(n=1) Psychotic disorder NOS(n=2) Unspecified non-organic psychosis(n=3) 21 Relatives	26 F: 16 M	Patients: 26 Relatives: 52	10 prompts per day, over 6 days	Dyad contact Dyad behaviourally controlling interactions i) 'Directly influencing' behaviours ('nagging' and 'encouraging') ii) 'Buffering' interactions ('helping;' 'taking control' and 'keeping an eye on').		Psychosis experiences	
Verdoux et al. (2003) France	79	Non-clinical	55 F: 24 M	22.1	5 prompts per day, over 7 days	Social company Change in company		Perceived hostility Strange impressions Unusual perceptions Thought influence	
Weijers et al. (2018) Netherlands	59	Schizophrenia(n=34) Psychotic disorder NOS(n=10) Schizoaffective disorder(n=10) Brief psychotic disorder(n=3) Delusional disorder(n=2)	25 F: 34 M	31.8	10 prompts per day, over 6 days	Event-related stress Activity-related stress		Psychotic experiences	
Wigman et al. (2015) ^g ** Netherlands	263	Participants with psychosis	84 F: 179 M	35.5	10 prompts per day, over 6 days or 10 prompts per day over 5 days	Momentary mental state (cheerful, insecure, content down)		Paranoia	

Note. Superscript identifies studies with fully or partially overlapping samples. FEP=First episode psychosis, ARMS=At-risk mental state, UHR=Ultrahigh risk

*Study pooled data from six different studies: Collip et al. (2011); Lataster et al. (2011; 2013); Myin-Germeys et al. (2001); Van der Steen et al. (2017); Thewissen et al. (2008)

**Study pooled data from seven different studies: Bak et al. (2009); Collip et al. (2011); Collip et al. (in preparation); Lataster et al. (2011; 2013); Myin-Germeys et al. (2001); Thewissen et al. (2008)

Table 2: Results of risk of bias assessment

Study	Unbiased selection of the cohort	Sample size calculated	Adequate description of the cohort	Validated method for ascertaining clinical status or participant group	Validated methods for assessing predictor variable(s)	Validated methods for assessing outcome variable(s)	Missing data minimal	Analysis controls for confounding variables	Analytic methods appropriate	Time-stamped response	Pseudo-random prompts	Included timepoints completed within 15 minutes	Included participants completed a third of all timepoints
Barrantes-Vidal et al. (2013)	Can't tell	No	Partial	Yes	Yes	Yes	No	No	Yes	Yes	Yes	Can't tell	Can't tell
Ben-Zeev et al. (2011)	Can't tell	No	Yes	Yes	Yes	Yes	Partial	Yes	Yes	Yes	Yes	Yes	Yes
Ben-Zeev et al. (2012a)	Yes	No	Yes	Yes	Partial	Partial	No	Yes	Yes	Yes	No	Yes	Can't tell
Ben-Zeev et al. (2012b)	Partial	No	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Can't tell
Berry et al. (2018)	Yes	No	Yes	No	Yes	Yes	Partial	Yes	Yes	Yes	Yes	Yes	No
Collip et al (2011).	Can't tell	No	Partial	Yes	Partial	Yes	No	Yes	Yes	No	Yes	Yes	Yes
Collip et al (2013).	Yes	No	Yes	Yes	Partial	Yes	No	No	Yes	No	Yes	Yes	Yes
Cristóbal-Narváez et al. (2015)	Can't tell	No	Partial	Yes	Partial	Yes	No	No	Yes	Yes	Yes	Yes	Can't tell
Hartley et al. (2014)	Partial	No	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No

Hartley et al. (2015)	Partial	No	Yes	Yes	No	No	No	No	Yes	Yes	Yes	Yes	No
Ho-Wai So et al. (2018)	Can't tell	No	Partial	Yes	Yes	Yes	No	Yes	Yes	Yes	Can't tell	Can't tell	Yes
Klippel et al. (2018a)	Yes	No	Yes	Yes	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Klippel et al. (2018b)	Can't tell	No	Partial	Can't tell	Partial	Partial	No	Yes	Yes	No	Yes	Can't tell	Can't tell
Kramer et al. (2014)	Yes	No	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Can't tell	Yes
Krkovic et al. (2018a)	Can't tell	No	Partial	Yes	Yes	Yes	No	No	Yes	Yes	No	Can't tell	Can't tell
Krkovic et al. (2018b)	Can't tell	No	Partial	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Can't tell	Yes
Lardinois et al. (2011)	Can't tell	No	Partial	Yes	Partial	Yes	No	No	Yes	No	Yes	Yes	Yes
Lödtker et al. (2017)	Partial	No	Partial	No	Partial	Can't tell	No	Yes	Yes	Yes	No	No	Can't tell
Myin-Germeys et al. (2001)	Partial	No	Partial	Yes	Partial	Partial	No	No	Yes	No	Yes	Yes	Yes
Nittel et al. (2018)	Partial	No	Partial	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Can't tell	Can't tell
Palmier-Claus et al. (2012)	No	No	Partial	Yes	Partial	Yes	Partial	Yes	Yes	No	Yes	Yes	No
Palmier-Claus et al. (2013)	No	No	Partial	Yes	Partial	Partial	Partial	Yes	Yes	No	Yes	Yes	No
Peters et al. (2012)	Yes	No	Partial	Yes	No	No	No	No	Yes	No	Yes	Yes	Yes
Reininghaus	Yes	No	Yes	Yes	Partial	Partial	Yes	Yes	Yes	Yes	Yes	Yes	Yes

et al. (2016)

Sitko et al. (2016)	Can't tell	No	Partial	Yes	Partial	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	Can't tell
Thewissen et al. (2008)	Partial	No	Partial	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Thewissen et al. (2011)	Partial	No	Partial	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Udachina et al. (2009)	Yes	No	Partial	Yes	Partial	Partial	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Udachina et al. (2014)	Can't tell	No	Partial	Yes	Partial	Partial	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Varese et al. (2011)	Partial	No	Partial	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes	Yes
Vasconcelos e Sa et al. (2016)	Yes	Partial	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes	Yes
Verdoux et al. (2003)	Yes	No	Partial	Yes	Can't tell	Can't tell	Partial	Yes	Yes	No	Yes	Can't tell	Can't tell	Can't tell
Weijers et al. (2018)	No	No	Partial	Yes	Partial	Partial	No	No	Yes	Yes	Yes	Can't tell	Yes	Yes
Wigman et al. (2015)	Can't tell	No	Partial	Can't tell	Can't tell	Can't tell	Can't tell	No	Yes	No	Yes	Can't tell	Can't tell	Can't tell

Table 3: Summary of differences and effect sizes for reviewed studies

Predictor/Outcome	No. of studies	No. of significant associations/ No. of associations tested	β	OR
Negative affect				
Psychotic experiences	2	4/5	0.13 to 0.25	-
Delusional thinking	1	1/1	0.68	-
Auditory hallucinations	1	1/1	0.30	-
Paranoia	5	8/15	0.02 to 0.31	-
Anxiety				
Delusions (control, reference & grandiosity)	1	0/1	-	1.09
Delusions of control	1	0/1	-	1.08
Delusions of reference	1	0/1	-	1.03
Delusions of grandiosity	1	0/1	-	1.09
Paranoia	2	2/2	-	1.25 to 1.32
Sadness				
Delusions (control, reference & grandiosity)	1	0/1	-	0.95
Delusions of control	1	0/1	-	1.05
Delusions of reference	1	0/1	-	0.95
Delusions of grandiosity	1	0/1	-	0.87
Paranoia	1	1/1	-	1.26
Insecurity				
Paranoia	1	1/1	0.03	-
Stress				
Paranoia	1	1/1	0.24	-
Anger/irritability				
Paranoia	1	0/1	-	1.06
Down				
Paranoia	2	1/2	0.05	0.92
Positive affect				
Psychotic experiences	1	0/2	0.47 to 0.80	-
Auditory hallucinations	1	1/1	-0.19	-
Delusional thinking	1	1/1	-0.38	-
Cheerful				
Paranoia	1	0/1	0.01	-
Content				
Paranoia	1	0/1	0.00	-
Relaxed				
Loss of control	1	1/3	-0.03 to 0.01	-
Experiential avoidance				
Paranoia	2	10/10	0.05 to 0.18	-

Auditory hallucinations	1	1/2	-	1.17 to 1.20
Aberrant Salience				
Psychotic experiences	1	3/3	0.17 to 0.24	-
Paranoia	1	2/2	0.28 to 0.30	-
Threat anticipation				
Psychotic experiences	2	6/6	0.10 to 0.17	-
Worry				
Auditory hallucinations	1	2/2	0.21 to 0.57	-
Paranoia	1	2/2	0.33 to 0.62	-
Rumination				
Auditory hallucinations	1	2/2	0.20 to 0.63	-
Paranoia	1	2/2	0.20 to 0.49	-
Thought control				
Auditory hallucinations	1	1/2	0.08 to 0.58	-
Paranoia	1	2/2	0.14 to 0.33	-
Momentary cognitive self-consciousness				
Delusional thinking	1	4/5	0.04 to 0.18	-
Hallucinations	1	4/5	-	2.02 to 5.87
Dissociation				
Auditory hallucinations	1	2.2	-	1.17 to 1.20
Jumping to conclusions bias				
Paranoia	1	2/2	0.10 to 0.11	-
Event-related stress				
Psychotic experiences	4	7/8	0.03 to 0.65	-
Hallucinations	2	2/2	-	2.89 to 3.18
Delusional thinking	2	2/2	0.07 to 0.85	-
Paranoia	2	6/6	0.02 to 0.06	-
Activity-related stress				
Psychotic experiences	4	8/8	0.07 to 0.55	-
Paranoia	1	1/1	0.07	-
Delusional thinking	2	2/2	0.13 to 0.15	-
Hallucinations	2	2/2	-	1.10 to 1.11
Social stress				
Psychotic experiences	3	0/2	0.02 to 0.51	-
Delusional thinking	2	2/2	0.10 to 0.11	-
Paranoia	1	3/3	0.06	-
Hallucinations	2	0/4	-	1.08 to 1.09
Situational stress				
Psychotic experiences	2	2/2	0.034 to 0.035	-
Area-related stress				
Psychotic experiences	1	3/3	0.68 to 0.90	-
Event type				
Paranoia	1	0/4	-	0.964 to 1.390

Activity type				
Delusions	1	0/1	-	-
Feeling unwanted				
Psychotic experiences	2	2/2	0.07 to 0.08	-
Paranoia	2	2/2	0.14 to 0.15	-
Social disconnectedness				
Psychotic experiences	2	4/4	-0.01 to 0.71	-
Social connectedness (Feeling close to others)				
Paranoia	1	1/1	-0.03	-
Being alone				
Psychotic experiences	2	0/2	0.00	-
Paranoia	4	1/6	-0.01 to 0.10	-
Familiar company				
Delusions	1	1/1	-0.72	-
Perceived hostility	1	1/3	-0.52	-
Strange impressions	1	0/3	-0.02 to -0.21	-
Thought influence	1	0/3	0.06	-
Unusual perceptions	1	0/3	-0.04 to 0.03	-
Unfamiliar company				
Delusions	1	0/1	-	-
Perceived hostility	1	0/3	0.20	-
Strange impressions	1	0/3	0.10 to 0.49	-
Thought influence	1	0/3	0.04	-
Paranoia	1	4/7	-0.07 to 0.11	-
Unusual perceptions	1	3/6	-0.02 to 0.44	-
Changes in company				
Delusions	1	0/1	-	-
Perceived hostility	1	2/9	-0.31 to 0.20	-
Strange impressions	1	1/12	-0.34 to 0.79	-
Thought influence	1	0/9	-	-
Unusual perceptions	1	2/12	-0.09 to 0.93	-
Dyad contact				
Psychotic experiences	1	0/3	-0.14 to 0.00	-
Encouraging				
Psychotic experiences	1	0/3	-0.03 to 0.18	-
Nagging				
Psychotic experiences	1	0/3	0.09 to 0.19	-
Helping				
Psychotic experiences	1	0/3	-0.08 to 0.17	-
Taking control				
Psychotic experiences	1	1/3	-0.44 to 1.04	-
Keeping an eye on				
Psychotic experiences	1	0/3	0.00 to 0.11	-

Self-esteem							
Paranoia	4	5/12	-0.03 to 0.09	0.81			
Change in self-esteem							
Paranoia	1	2/2	0.17	-			
Self-stigma							
Psychotic experiences	1	1/2	0.01 to 0.08	-			
Attachment insecurity							
Paranoia	1	3/3	0.14 to 0.17	-			
Auditory hallucinations	1	1/2	-	1.21 to 1.29			
Social media use							
Paranoia	1	0/1	0.13	-			
Content posting							
Paranoia	1	1/1	0.66	-			
Consuming content							
Paranoia	1	0/1	-0.53	-			
Direct communication							
Paranoia	1	0/1	0.49	-			
Posting about daily activities							
Paranoia	1	0/1	0.16	-			
Posting about opinions							
Paranoia	1	0/1	-0.10	-			
Posting about feelings							
Paranoia	1	1/1	2.72	-			
Posting pictures/videos							
Paranoia	1	0/1	0.32	-			
Venting on social media							
Paranoia	1	1/1	2.13	-			
Looking through newsfeeds							
Paranoia	1	1/1	-0.88	-			
Viewing 'friends' profiles							
Paranoia	1	0/1	-0.10	-			
Viewing profiles of people who are not 'friends'							
Paranoia	1	1/1	1.26	-			
Commenting on another person's post/picture							
Paranoia	1	1/1	0.66	-			
Liking another person's post/picture							
Paranoia	1	0/1	0.01	-			
Sharing another person's post/picture							
Paranoia	1	0/1	0.29	-			
Social rank							
Paranoia	1	1/1	-0.08	-			
β	=unstandardised	coefficient	values,	OR	=Odds	ratio	value.

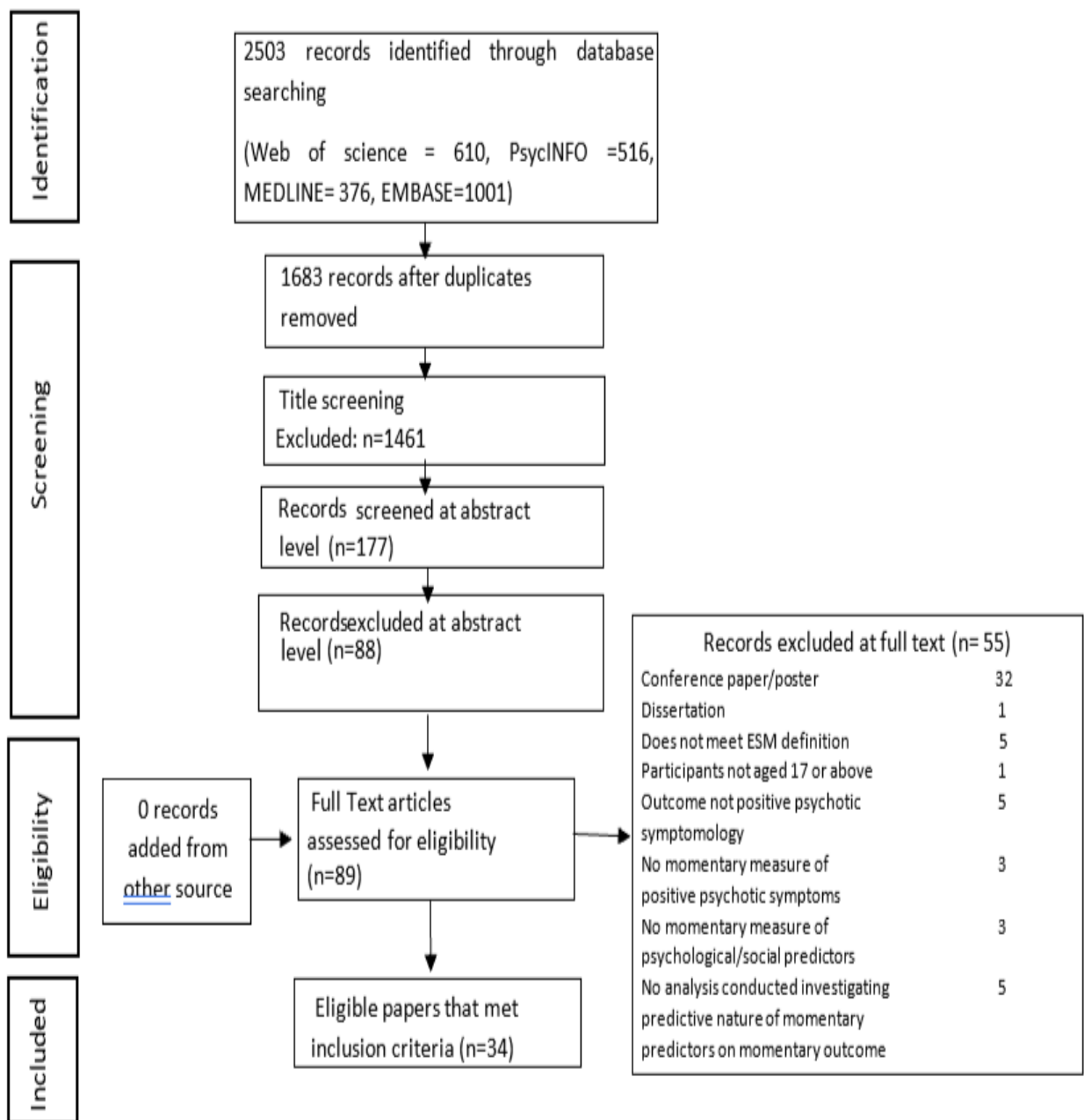


Figure 1: Search process and results

Paper 2: Empirical Study

Fluctuations in proximity seeking and paranoia

The following paper has been prepared for submission to ‘Acta Psychiatrica Scandinavica.’ The guidelines for authors can be found in Appendix A.

Word count: 7,427 (excluding tables and references)

Abstract

Objectives: This study aimed to investigate associations between proximity seeking, stress and paranoia in the context of daily life, and whether these relationships are moderated by trait attachment styles.

Methods: Sixty nonclinical participants completed 3,423 assessments of state stress, proximity seeking and paranoia over a 6-day period using an experience sampling method (ESM). Multilevel modelling was performed to evaluate relationships between variables.

Results: Post hoc analysis showed antecedent events subjectively appraised as very unpleasant or very pleasant predicted greater levels of momentary proximity seeking at the subsequent time-point; aligning with Bowlby's conceptualisation that the attachment system is activated in response to novel situations, whether positive or negative. Findings indicated that greater stress predicted greater subsequent shifts or variability in proximity seeking, which serve as a behavioural indicator of the attachment system coming "online." Changes in proximity seeking were not associated with momentary paranoia. However, for individuals with an avoidant attachment style, greater shifts in proximity seeking resulted in greater subsequent reports of paranoia.

Conclusions: These findings suggest that, in daily life, the attachment system comes "online" in response to stress and, consistent with attachment theory, that a healthy attachment system serves to adaptively regulate affect. For those with an avoidant attachment style, an "online" attachment system may exacerbate paranoid thoughts possibly due to the activation of attachment-related beliefs that one should be fearful of unavailable others and instead rely on one's autonomy to regulate affect. These findings highlight the need to consider attachment in the assessment and formulation of paranoia.

Key Words: Experience Sampling Methodology; Attachment; Proximity Seeking; Paranoia; Stress

Significant Outcomes

- Antecedent events subjectively appraised as very unpleasant or very pleasant predicted greater levels of momentary proximity seeking; aligning with Bowlby's conceptualisation that attachment is a dynamic system activated in response to novel situations, whether positive or negative.
- Greater momentary stress significantly predicted greater shifts or disturbances in proximity seeking, which serves a behavioural indicator of the attachment system coming "online" in daily life.
- Results showed that for individuals with an avoidant attachment style, greater shifts in proximity seeking were positively associated with momentary reports of paranoia.
- Findings suggest that a healthy attachment system serves to adaptively regulate affect, and whether the attachment system being "online" results in paranoid thinking, is dependent on an individual's trait attachment style.

Limitations

- The study had a relatively small sample size, which may have resulted in insufficient power to detect interaction effects of trait attachment
- A key limitation of the present research is its correlational nature; thus, we cannot determine whether causal relationships exist between variables studied.

Introduction

Paranoia has been defined as a ‘persistent mistrust or suspicion of people and a corresponding tendency to interpret the actions of others as deliberately threatening or demeaning⁹¹’. Paranoia is the most commonly reported delusion in the context of psychosis⁹² and is associated with interpersonal difficulties, weaker social cohesion and high levels of distress⁹³. Continuum models of psychosis⁹⁴ suggest paranoia can be experienced in varying levels of severity in the general population, and therefore is not inevitably associated with the presence of a disorder (see Verdoux & van Os⁵ for a review). Research has therefore sought to elucidate how psychological mechanisms contribute to paranoid thinking in an attempt to enable psychological interventions to be tailored more appropriately⁶. One such mechanism that has received attention is attachment, as insecure attachment in particular is considered to facilitate a paranoid attributional style, in the presence of other contributing factors⁶.

Attachment theory⁹⁵ posits that infants form emotional bonds with their primary caregiver through proximity seeking and maintaining behaviours. Bowlby⁹⁵ conceptualised proximity seeking as an innate affect regulation process in which primary caregivers’ function as a ‘safe haven’ from which infants can seek comfort, reassurance and security during times of distress. Infants internalise their experience of interactions with their primary caregiver which enables them to develop internal working models about the self and others⁹⁵. A secure attachment style is developed when caregivers’ responses to the infant’s bid for proximity are consistent, responsive, sensitive and emotionally available. Insecure attachment can be understood within this framework of affect regulation^{95,96}. When primary caregivers fail to alleviate distress by providing unresponsive or unpredictable responses to the child’s proximity seeking behaviour, negative working models about the self and others develop⁹⁵, which is thought to result in the development of behavioural orientations towards attachment figures such as withdrawal or excessive proximity seeking to regulate one’s affect. These negative working models continue to guide behaviour in future attachment related interactions throughout the lifespan^{95,97} and can increase sensitivity to future stress, criticism and negative responses from others⁹⁶.

The behavioural strategies individuals use to regulate their affect have been shown to vary according to attachment style^{98–100}. An anxious attachment style is defined by a negative self-perception, expectations of separation and rejection, dependence on others and exaggerated affect or helplessness to maintain proximity to primary caregivers^{101,102}.

Individuals with an anxious attachment style attempt to seek proximity in times of distress to minimise distance from others, elicit reassurance and regulate negative affect, despite mistrust of both the availability and consistency of responses from primary caregivers¹⁰¹. In contrast, avoidant attachment is associated with expectations that attachment figures are unavailable and unresponsive, leading to a distancing or withdrawal from others and reliance on one's own autonomy during times of distress¹⁰⁰. These differences in proximity seeking behaviours in an attempt to regulate one's affect are distinguishing features of the different insecure attachment styles¹⁰⁰.

Research has consistently shown associations between insecure attachment and paranoia in non-clinical,¹⁰³ subclinical¹⁰⁴ and clinical¹⁰³ samples. Previous research has largely been cross-sectional in nature examining trait models of attachment, at a single timepoint. However, there are limitations to treating attachment as a trait variable. It is known that attachment is a dynamic system that can be “on-or offline” at any given time,¹⁰⁵ as attachment representations (currently activated internal working models about the self and others) have been shown to fluctuate over short periods of time^{106,107}. Studies conducted to date have therefore failed to capture these momentary shifts or variability in the attachment system, which are meaningfully impacted by contextual cues¹⁰⁸. To this end, measuring changes in proximity seeking, which serve as a behavioural indicator of the attachment system, could provide one way to map whether the attachment system is “online or not” in the flow of daily life; permitting a more dynamic understanding of the attachment system. Furthermore, this knowledge would be useful in enabling interventions to be better directed at times when the attachment system comes “online” or at triggers for the attachment system.

Experiencing Sampling Methodology (ESM) captures the frequency, intensity and patterning of momentary mental processes and behaviour¹⁰⁹. ESM utilises a more intensive assessment schedule than traditional approaches, involving multiple assessments per day; therefore, ESM enables more fine-grained analysis of patterns of attachment fluctuations in everyday life. A recent study⁶⁹ employed ESM to examine associations between state attachment and paranoia in a mixed sample of clinical participants (n=20) with schizophrenia spectrum diagnoses and healthy controls (n=20) with no history of mental health difficulties. The authors found that elevated stress predicted an increase in attachment insecurity, which in turn predicted a subsequent increase in paranoia; findings remained significant when covarying for self-esteem and auditory hallucinations. A major limitation of this study was that only emotional items of state attachment were used;

therefore, behavioural strategies individuals with different attachment styles engage in to regulate affect were not measured. Secondly, the authors utilised a secure-versus-insecure binary group; therefore, differences in patterns of attachment fluctuations cannot be determined for the insecure-anxious and insecure-avoidant subtypes of attachment (Hesse, 2008).

Monitoring and appraisal of stressful events leads to activation of proximity seeking as part of the attachment system's attempt to regulate affect^{100,101}. The current study therefore seeks to measure proximity seeking behaviour based on the assumption that different insecure attachment styles will manifest in terms of differences in proximity seeking behaviour in everyday life^{100,101}. Theoretically, we expect that an anxious attachment style may lead to over-activation of proximity-seeking in response to stress, as the attachment system comes "online". In contrast an avoidant attachment style may result in the suppression of proximity seeking in response to stress.

Fluctuations in the momentary activation of the attachment system may in turn explain momentary experiences of paranoia. Theoretically, we expect that individuals with an anxious attachment style will activate a negative self-model and cognitions about others as unreliable, following the attachment system coming "online", resulting in anxiously attached individuals attempting to seek proximity to regulate negative affect^{100,101}. This over-activation of proximity seeking fails to alleviate distress and instead results in increased monitoring of threats to the self and signs of attachment-figure unavailability and possible rejection, reinforcing the sense of oneself as vulnerable^{100,101} which may lead to increases in paranoia⁹³. Conversely, individuals with an avoidant attachment style who rely on their own autonomy and socially withdraw to maximum distance from others during times of stress^{100,101} may generate a greater sense of disconnection from others, which in turn provides less corrective feedback resulting in increased mistrust of others^{93,101}. Subsequently, this sense of disconnect may contribute to perceptions that one is at risk of harm or maltreatment from others which characterises paranoid ideation⁹³.

Aims

The first objective of the current study is to examine whether different attachment patterns are associated with different proximity seeking responses to stress. This will be achieved by firstly examining the relationship between state stress and level of proximity seeking and secondly by exploring if this relationship is moderated by trait attachment style. It was hypothesised that:

- i) Overall, stress will have a positive relationship with proximity seeking (i.e. greater stress is associated with greater proximity-seeking)
- ii) High attachment anxiety will positively moderate this relationship (i.e. a stronger positive relationship between stress and proximity-seeking in those higher in attachment anxiety)
- iii) High attachment avoidance will negatively moderate this relationship (i.e. a weaker positive relationship, or even increasingly inverse relationship, between stress and proximity-seeking in those higher in avoidant attachment)

The second objective of this study is to examine whether elevated stress is associated with the magnitude of change in proximity seeking over time, and whether this relationship is moderated by trait attachment. It was hypothesised that:

- i) Overall, stress will have a positive relationship with change in proximity seeking (i.e. greater stress is associated with a greater shift or change in proximity seeking)
- ii) Insecure attachment will positively moderate this relationship (i.e. greater stress is associated with a greater shift in proximity seeking for individuals with high attachment anxiety or high attachment avoidance).

The third objective of this study is to test whether change, or shift, in proximity seeking is associated with state paranoia. It was hypothesised that:

- i) Overall, change in proximity seeking will have a positive relationship with paranoia (i.e. greater change in proximity seeking is associated with greater paranoia)

- ii) Insecure attachment will positively moderate this relationship (i.e. greater change in proximity seeking is associated with greater paranoia for individuals with high attachment anxiety or high attachment avoidance).

These relationships will be tested when controlling for the confounding effects of negative affect, social comparison and gender (paranoia analyses only) which have been shown to be associated with experiences of paranoia^{29,110}.

Method

Sample

Ethical approval was granted by the university's research ethics committee (reference 2018-4444-7230; See Appendix E. Participants were recruited from a university in Northern England through posters placed around campus, emails and the university participation credit scheme. Eligibility criteria included: students aged 18 or above and command of the English language sufficient to complete questionnaires and ESM assessments. Potential participants were excluded if they did not have regular access to a smart mobile phone and if they had not had at least one romantic relationship due to the Experience in Closeness Relationship Scale-Short form¹¹¹, utilised to measure trait attachment, assessing a person's feelings in romantic relationships.

Measures

Questionnaires

Baseline questionnaire measures (see Appendix F) were administered before the ESM assessment period to ascertain trait-level measures of attachment, paranoia, mood and self-perceptions of social rank. These were primarily chosen to characterise the sample, but also to enable researchers to control for confounders of the relationship between stress, proximity seeking and paranoia.

Demographic Information. Age, gender and ethnicity were recorded.

Attachment Figure. Participants were asked to select an attachment figure to whom their proximity seeking behaviour would be measured. Our definition of an attachment figure was adapted from Trinke and Bartholomew's¹¹² Attachment Network Questionnaire, which is a commonly used measure of adult attachment relationships and attachment hierarchies^{112,113}. Detailed instructions (see Appendix F) were given to participants to help them identify an appropriate attachment figure in line with this definition (e.g. a person to whom they feel a strong emotional connection and they would like to approach for support).

*Experience in Close Relationship Scale-Short Form (ECR-S)*¹¹¹. The ECR-S is a self-report measure of trait attachment. Participants are asked to rate 12-items on a seven-point Likert Scale ranging from 1 (strongly disagree) to 7 (strongly agree). The ECR-S returns a continuous score for two subscales: attachment anxiety and attachment avoidance. This scale has good internal consistency and construct validity¹¹¹. In this study, the internal consistency of the ECR-S avoidant subscale was acceptable ($\alpha=.76$). The ECR-S anxious subscale had questionable internal consistency ($\alpha=.62$).

*Paranoia Scale*¹¹⁴. This 20-item self-report scale measures paranoia and was designed for use in student samples. Items are rated on a five-point Likert Scale ranging from 1 (not at all applicable to me) to 5 (extremely applicable to me). The scale produces a total score. Previous research has demonstrated this scale has good internal reliability and adequate convergent and discriminant validity¹¹⁴. High internal consistency for the Paranoia Scale was demonstrated in this study ($\alpha=.88$).

*Depression Anxiety Stress Scale-21 (DASS-21)*¹¹⁵. The DASS-21¹¹⁵ is a widely used self-report measure of trait depression, anxiety and stress. Items are scored on a four-point scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much or most of the time). The scale returns a continuous score for the anxiety, depression and stress subscales. The DASS-21 has been found to have good internal reliability and validity.¹¹⁵ In the current study, the DASS-21 anxiety subscale had good internal consistency ($\alpha=.80$). The DASS-21 depression and stress subscales had high internal consistency ($\alpha=.87$ and $\alpha=.84$, respectively).

*Social Comparison Scale (SCS)*¹¹⁶. The SCS measures self-perceptions of social rank and relative social standing. Respondents are required to make a global comparison of themselves in relation to others and rate themselves on 11 items on a 10-point Likert Scale. Lower scores relate to feelings of inferiority and low rank perceptions of oneself. The SCS in this study had high internal consistency ($\alpha=.88$).

Experience Sampling Method

Item development

The ESM items used in the present study (listed in Appendix G) were taken from previous research^{50,62,70} or produced based on literature exploring key facets of the constructs of interest following a rigorous process involving several stages of design, review, consultation and revision. Internal consistency was computed for the first assessment point (day 1, assessment 1).

ESM items

The items listed below were used to capture moment-to-moment variation in participants' experiences of paranoia, stress and proximity seeking in the flow of daily life.

State Paranoia. State paranoia was defined as the total score of four statements rated on seven-point Likert scales from 1 (not at all) to 7 (very much). The statements assessed suspiciousness and paranoid ideation: 'I feel that others dislike me,' 'I feel that others might hurt me,' 'I feel suspicious,' and 'I feel safe' (reversed scale). These items have been used in previous ESM studies with non-clinical samples^{60,70}. This scale had acceptable internal consistency in the current study ($\alpha =.74$).

State Stress. At every ESM assessment point, participants were instructed to rate the extent to which they felt stressed immediately before the text prompt. The item 'I feel stressed' was rated on a seven-point Likert scale (1=not at all to 7=very much). An item of 'event-related stress' was also utilised in this study based on previous research^{50,62}. This item asks participants to state and rate the most important event to occur since the last beep from 'very unpleasant' (-3) to 'very pleasant' (3). Lower scores represent a greater degree of

dislike for the event and are indicative of greater event-related stress. The individual score for each of these two items were used in the analyses.

Proximity Seeking. At every ESM assessment point, participants were required to rate the number of times since the last beep that they had attempted to contact their attachment figure across five modes of communication: face-to-face contact, telephone call, text messaging, email messaging and social networking sites. Items were rated 0 times, 1-2 times, 3-4 times, 5-6 times, 7-8 times, 9-10 times and 10+ times. A total score was calculated by summing together the number of contact attempts across these five modes of communication. This total proximity seeking score was used in the analysis. Cronbach's alpha was not calculated as proximity seeking items were not expected to inter-correlate because some participants may choose to stick to a preferred mode of communication.

ESM software and sampling procedure

The ESM items were uploaded to, and completed via, an online survey platform developed by an eLearning Technologist. Participants were provided with a unique Participant Identification Number and password to log into the online survey platform. Participants were prompted to complete the diary questions in response to receiving a text message through the University text messaging service to their own mobile phone. Prompts were delivered six times per day over a period of 14 days. This assessment period was chosen as this period needed to be of adequate length to capture momentary changes in state stress. Previous research (Taylor, Palmier-Claus, Dodd & Bucci, in preparation) found the number of stressors experienced by a student sample across a six-day signal-contingent ESM ranged from 1 to 9 (Mean=2.53). Therefore, a 14-day assessment period with six beeps per day was chosen to achieve a balance between generation of sufficient valid, variable data with participant burden. The timing of the prompts was based on a pseudo-random ESM schedule; one beep would occur within a two-hour period, with a possible minimum of 15-minutes and a maximum of two-hours between two consecutive beeps, with limits of 10am and 10pm This sampling strategy was utilised to maximise adherence to the ESM procedure²⁰. ESM reports were considered valid if completed within a 15-minute window of the beep, a criterion that was applied as part of data preparation.

Procedure

All potential participants were instructed to visit the study's website to view the Participant Information Sheet (Appendix H) and to complete the screening question: "*I confirm I have had at least one romantic relationship.*" Eligible participants were then able to book a slot to meet with the researcher. All eligible participants provided written consent for participation (Appendix I). Once received, baseline questionnaire measures were completed. After completion, participants were briefed about the experience sampling procedure. Time was taken to familiarise participants to the ESM question-and-answer format and provide them with the opportunity to practice completing the ESM diary through the online survey platform and ask any questions. The researcher provided participants with instructions and contact details for use in case of difficulty. This initial meeting took place the day participants started the ESM phase to maximise adherence to the protocol¹⁰. On the first day of the experience sampling phase, each participant was contacted to confirm the functionality of the text prompts and online survey platform, and ensure all entries were being completed correctly. Participants were also contacted on the seventh day of the ESM phase to review any difficulties and foster motivation. After the ESM phase, follow-up questionnaire measures were completed. All participants were debriefed (Appendix J).

Statistical analysis

Power calculation for multi-level models relies on a potentially large number of parameters and the number of level-1 units nested within each level-2 unit^{117,118}. Rules of thumb do exist however regarding required sample sizes in multilevel modelling. Snijders & Bosker^{117,118} suggested that $n \geq 30$ is adequate for non-biased significance tests of fixed effects. Similarly, 30 level-2 units with 30 level-1 units per cluster has also been suggested¹¹⁹ although, fewer level-1 units per cluster may be necessary¹²⁰. The sample size of $n=60$, with 84 timepoints within each level-2 unit was therefore agreed by the research team.

A change in proximity seeking variable was computed using the absolute change value between two succeeding reports. The absolute change value was calculated by taking the absolute difference between the ESM proximity seeking score at the current timepoint (t) minus the proximity seeking score on the previous timepoint (t-1). The absolute change score gives higher values when there are larger differences between the scores of two

consecutive timepoints but ignores the direction of change which is appropriate when conducting analyses regarding the magnitude of shift in proximity seeking. Change scores were only calculated for consecutive beeps within a day as the gap between beeps across days is considered too large to be a valid measure of momentary experience^{10,31}.

All analyses were performed on STATA version 14¹²¹. All questionnaire-level and momentary data were assessed for normality via histogram inspection. All scales were normally distributed. Missing data at beep level scales were managed by using the average of the available items. ESM data typically have a three-level hierarchical structure (observations nested within days, nested within participants) which violates the assumption of independence of observations. Multi-level modelling is therefore required for analysis of ESM data as multi-level modelling can account for the clustering in outcomes and handle substantial amounts of missing data without excluding whole cases¹²²⁻¹²⁴. Effect sizes are reported as standardised regression coefficients (β) for multilevel models with continuous outcomes. P values, Standard Error and 95% Confidence Intervals (CI) are reported for all analyses.

Multilevel regression analyses were conducted using the MIXED command with maximum likelihood estimation. Participant number and day were included as random effects for all analyses to control for the nested structure of the data. Multilevel regression models were estimated to investigate whether stress ('I feel stressed') predicted the level of proximity seeking at the subsequent timepoint. Stress was therefore lagged such that it reflected stress at the previous beep (t-1). Multilevel regression analyses were performed to test whether event-related stress predicted level of proximity seeking. Event-related stress was not lagged as the wording of the item ('Since the last beep') refers to the momentary period between the previous beep and the current beep (i.e. between t-1 and t). A quadratic relationship was suspected between event-related stress and proximity seeking based on visual inspection of responses. Thus, post hoc likelihood ratio tests were performed to determine whether the inclusion of event-related stress squared as an additional predictor benefited model fit. A post hoc decision was therefore made to enter event-related stress squared as an additional variable in models where the likelihood ratio tests provided evidence that inclusion of the quadratic terms significantly added to model fit. Multilevel regression models were estimated to investigate whether: i) the relationship between stress and proximity seeking; and ii) the relationship between event-related stress and proximity seeking were moderated by attachment. For all analyses, person-level attachment variables (attachment anxiety and attachment avoidance) were grand mean centred. Multilevel

regression analyses were conducted to examine whether stress at the previous timepoint (t-1) predicted the magnitude of change in proximity seeking and if event-related stress predicted the magnitude of change in proximity seeking. Multilevel regression models were estimated to investigate whether attachment moderates the relationship between i) stress (t-1) and change in proximity seeking and ii) event-related stress and change in proximity seeking. Due to the increased risk of a false-positive finding (Type-1 error) when running multiple analyses, the Bonferroni correction was applied to all models with either stress variable entered as a predictor by employing the adjusted p-value of 0.025. Multilevel regression analyses were performed to test whether change in proximity seeking predicted paranoia and if attachment moderates the effect of change in proximity seeking on paranoia. Sensitivity analyses were performed to determine whether any of the associations were substantively reduced when trait depression, trait anxiety, trait social comparison and gender (for paranoia analyses only) were entered as co-variates into the model.

Results

Sample characteristics

Eleven potential participants were excluded at the screening phase as they did not report experiencing a romantic relationship. Sixty-two participants consented to take part in the study. Two participants did not complete the ESM phase and thus the final sample for analysis comprised 60 participants. Participants were predominately White British, female and the majority of participants identified their mother as the attachment figure. Table 1 presents the characteristics of the sample.

Retention and adherence

Of the 62 participants who started the ESM phase, 60 completed the full ESM schedule and completed more entries than the traditionally accepted one third of assessment points¹⁰. Of a possible 5,040 assessment points, 3,423 were completed by participants within 15 minutes of each prompt, representing a 67.9% overall response rate.

Does stress predict the level of proximity seeking?

To explore whether elevated stress predicted the level of proximity seeking, a multilevel linear regression analysis was conducted with proximity seeking total score as the dependent variable and stress lagged (t-1) as the independent variable. Results revealed that stress at the previous timepoint did not significantly predict levels of proximity seeking. This association remained non-significant when trait depression, trait anxiety and trait social comparison were entered as co-variates in the model (see Table 2; models 1 and 2).

A similar model was estimated using proximity seeking total score as the dependent variable and event-related stress as the independent variable. The post hoc likelihood ratio test provided evidence that inclusion of the quadratic terms improved model fit ($\chi^2(1) = 42.15, p < .001$); therefore, the multilevel regression analysis was run with event-related stress and event-related stress squared entered as independent variables in the model. A significant quadratic trend in event-related stress was observed with a turning point of 0.33 suggesting that as event-related stress decreased, proximity seeking reduced as participants sought less proximity to their attachment figure. However, after the turning point of 0.33 as event-pleasantness increased so did participants level of proximity seeking; although this finding should be interpreted with caution as when applying the adjusted p-value of 0.025 in line with the Bonferroni correction, only the quadratic relationship between event-related stress and proximity seeking remained significant. Therefore, the same conclusions about the relationship between event-related stress and level of proximity cannot be drawn as when both the linear and quadratic terms were significant using the standard 0.05 significance level. The size of the association between event-related stress and proximity seeking was unchanged when covarying for trait depression, trait anxiety and trait social comparison (see Table 2; models 3 and 4).

Does attachment moderate the relationship between stress and the level of proximity seeking?

To examine whether trait attachment style variables moderated the relationship between stress and level of proximity seeking, the above multilevel regression analyses were rerun with the insertion of either anxious attachment or avoidant attachment included as a potential moderator variable. Attachment style did not significantly moderate the relationship between stress and proximity seeking, regardless of the type of stress variable

used in the model or whether the linear or non-linear effects of event-related stress were investigated. This remained unchanged when trait depression, trait anxiety or trait social comparison were adjusted for within the models (see Table 2; models 5 to 16).

Does stress predict the magnitude of change in proximity seeking?

To explore whether elevated stress predicted the magnitude of change in proximity seeking, multilevel regression models were estimated with change in proximity seeking as the dependent variable and stress lagged (t-1) as the independent variable. Results showed that preceding stress was positively associated with the magnitude of change in proximity seeking. That is, a greater level of stress significantly predicted a larger change in proximity seeking between two consecutive time-points. This relationship remained significant when covarying for trait depression, trait anxiety and trait social comparison (see Table 3; models 1 and 2).

A similar model was estimated using proximity seeking total score as the dependent variable and event-related stress as the independent variable. The post hoc likelihood ratio tests showed that adding a quadratic term to the model did not make a substantive improvement to model fit ($\chi^2(1) = 2.12, p = .146$); therefore, the model was run with the linear event-related stress variable only. Results showed that as event-related stress decreases, there is a reduction in the magnitude of change in proximity seeking. In other words, greater event-related stress significantly predicted a larger change in proximity seeking between two succeeding timepoints. This relationship remained significant when trait attachment, trait depression, and trait social comparison were inserted in the model as co-variates. All findings were significant when applying the adjusted p-value of 0.025 (see Table 3; models 3 and 4).

Does attachment moderate the relationship between stress and the magnitude of change in proximity seeking?

To examine whether trait attachment style variables moderated the relationship between stress and change in proximity seeking, the above multilevel regression analyses were rerun with the insertion of either anxious attachment or avoidant attachment included as a potential moderator variable. No moderating effects of attachment style were found, regardless of whether stress lagged, or event-related stress were inserted as the predictor in

the model. Person-level attachment style continued to not moderate the path between stress and change in proximity seeking when controlling for the confounding effect of trait depression, trait anxiety and trait social comparison (see Table 3; models 5 to 16).

Does the magnitude of change in proximity seeking predict the level of paranoia?

To explore whether change in proximity seeking predicted the level of paranoia, multilevel regression models were estimated with state paranoia as the dependent variable and change in proximity seeking as the independent variable. Results revealed that change in proximity seeking did not significantly predict paranoia. This relationship remained nonsignificant when covarying for trait depression, trait anxiety, trait social comparison and gender (see Table 4; models 1 and 2).

Does the attachment moderate the relationship between the magnitude of change in proximity seeking and the level of paranoia?

To test whether trait attachment style variables moderated the relationship between change in proximity seeking and paranoia, the above multilevel regression analysis was rerun with the insertion of either anxious attachment or avoidant attachment included as a potential moderator variable. For anxious attachment, no significant moderating effects were identified. This remained the case when trait depression, trait anxiety, trait social comparison and gender were entered as co-variates in the model (see Table 4; models 3 to 6).

Attachment avoidance significantly moderated the relationship between change in proximity seeking and level of paranoia. Figure 1 illustrates the moderating effect of attachment avoidance on the relationship between change in proximity seeking and level of paranoia; as attachment avoidance increases, the relationship between change in proximity seeking and paranoia is greater. That is, change in proximity seeking is associated with greater subsequent paranoia for participants who are higher on attachment avoidance. Conversely, for participants who score lower on the attachment avoidance subscale, change in proximity seeking is associated with lower paranoia. The moderating effect of attachment avoidance on the relationship between change in proximity seeking and level of paranoia remained significant when controlling for the confounding effect of trait depression, trait anxiety, trait social comparison and gender (see Table 4; models 7 and 8).

Discussion

This study aimed to investigate the association with proximity seeking, stress and paranoia in the context of daily life, and whether these relationships are moderated by trait attachment style.

Findings on the relationship between preceding levels of stress and participants' level of proximity seeking supported our hypothesis. However, only event-related stress, but not general stress (i.e. reported stress not linked to a specific event), was predictive of participants' level of proximity seeking. The differing results for the event-related stress and general stress variables suggests that participants' subjective appraisals of the stressfulness of daily events may play a more important role in the activation of the primary attachment strategy of proximity seeking rather than their momentary levels of general stress¹⁰⁰. Specifically, as event-related stress decreased (i.e. event pleasantness increased) participants sought less proximity to their attachment figure. This aligns with Bowlby's⁹⁵ conceptualisation of proximity seeking as an affect regulating process during times of distress, as when faced with experiences which were subjectively appraised as more unpleasant individuals sought proximity to an attachment figure. Interestingly, there was not a linear relationship between event-related stress and level of proximity seeking as originally hypothesised. Inclusion of the event-related stress squared variable as an additional predictor variable during post hoc analyses showed that there was a quadratic relationship between event-related stress and proximity seeking as participants' level of proximity seeking was highest for events which participants' subjectively appraised as either very unpleasant or very pleasant. Thus, individuals may seek greater proximity to their attachment figure at times of stress but also in response to positive events. This quadratic relationship may have emerged from the event-related stress scale utilised in this study incorporating two orthogonal dimensions of pleasantness and unpleasantness as research has consistently evidenced that positive and negative affect do not represent two extremes of the same dimension but rather constitute two distinct dimensions of emotional experience¹²⁵⁻¹²⁸. The finding that participants' level of proximity seeking was highest for events rated as either very unpleasant or very pleasant aligns with Bowlby's⁹⁵ original conceptualisation of the attachment system as a dynamic, innate affect regulation system which is activated in response to novel situations or stimuli, whether positive or negative^{95,129}. This finding therefore supports utilising proximity seeking, which Bowlby posited as the primary attachment strategy to regulate affect^{95,100}, as a meaningful

indicator of the attachment system coming “online” in the flow of daily life. This therefore provides a more dynamic understanding of attachment in accordance with Bowlby’s⁹⁵ original, dynamic model of attachment and the proposed regulatory functions and consequences of maintaining proximity to attachment figures¹⁰⁰, as opposed to the ‘appraisal’ version of attachment theory often referred to in the cognitive literature^{97,130–132}.

The hypothesis that different insecure attachment subtypes would be associated with different patterns of proximity seeking responses was not supported as momentary levels of proximity seeking in response to stress did not vary by trait attachment style. Therefore, the authors specific hypotheses that high levels of trait attachment anxiety would positively moderate the relationship between antecedent stress and momentary levels of proximity seeking and conversely, that high level of attachment avoidance would negatively moderate this relationship were not supported. This finding is inconsistent with attachment theory;⁹⁵ thus, it is possible that whatever trait adult attachment measures capture this is not meaningfully linked to different patterns of proximity seeking as attachment theory would suggest⁹⁵. However, the failure to find a moderating effect of attachment on participants’ level of proximity may reflect methodological limitations of the current study, which are discussed below.

In line with our hypothesis, there was a positive relationship between stress and the magnitude of change in proximity seeking, as elevated stress was associated with a larger change in proximity seeking between successive time-points. This significant positive relationship was found for both event-related stress and general stress (i.e. reported stress not linked to a specific event). This finding could be interpreted as the attachment system becoming active or disturbed during times of stress, creating a shift in levels of proximity-seeking, in line with attachment theory^{95,100}.

The hypothesis that trait insecure attachment would positively moderate the relationship between preceding stress and magnitude of change in proximity seeking, or in other words that elevated stress would lead to a greater shift in proximity seeking for more insecure individuals (i.e. individuals scoring higher on insecure attachment subscales) was not supported, suggesting that the size of shift in proximity seeking in response to stress are comparable across individuals regardless of their level of trait attachment insecurity. This finding raises questions about some key principles of attachment theory^{95,97}.

The hypothesis that changes in proximity seeking between two successive time-points would be positively associated with levels of paranoid thinking was not supported.

However, findings showed that attachment avoidance (but not attachment anxiety) moderated the relationship between changes in proximity seeking behaviour and paranoia, supporting our hypothesis that trait attachment would positively moderate the relationship between magnitude of change in proximity seeking and levels of paranoid thinking. Individuals high on attachment avoidance experienced greater levels of paranoia in response to shifts in proximity seeking compared to individuals lower on attachment system. In fact, results showed that for individuals lower on attachment avoidance (e.g. below the average score for the sample), change or shift in proximity seeking resulted in less paranoia. Collectively, these findings are consistent with the idea that stress leads to shifts or disturbances in proximity seeking, which serves as an indicator of the attachment system coming “online”, but whether the attachment system being “online” is a problem, in terms of the occurrence of paranoia, is dependent on an individual’s overall attachment style. For those low in attachment avoidance, an online attachment system may lead to a soothing of threat-related cognitions like paranoia. This would be in-line with theory that a healthy attachment system serves to adaptively regulate affect⁹⁵. For those with an avoidant attachment style, however, an online attachment system may exacerbate paranoid thoughts. This may be due to the activation of attachment-related beliefs that one should be fearful of unavailable or untrustworthy others and instead rely on one’s autonomy to regulate affect^{100,101,133} resulting in paranoid thinking that one is vulnerable to intentional harm from others^{93,134}.

Several limitations of the study were identified. Firstly, the reliance on a self-report measure of attachment may not adequately tap covert attachment dynamics, as self-report measures of attachment have been found to not correlate well with more process-focused tools such as the Adult Attachment Interview^{135,136}. Therefore, whilst self-report attachment measures capture some relevant information, it is questionable whether individuals are able to accurately comment and reflect on their own attachment style. Future research should, therefore, consider using interview-based measures of trait attachment, such as the Adult Attachment Interview^{135,136} to provide a more thorough and robust assessment of attachment. The failure of the study to find a moderating effect of attachment on the path from stress to proximity seeking may provide support for the notion that individuals are unable to accurately comment on their own attachment responses.

A further related limitation is the measure of trait attachment employed in this study, the ECR-S¹¹¹, which only measures attachment in romantic relationships. Whilst romantic partners were the most commonly selected attachment figure (selected by 53.3%

of the sample), this measure may not have provided a valid measure of trait attachment for different relationships, which may have therefore resulted in trait attachment styles not mapping onto momentary proximity seeking behaviours. Furthermore, participants were asked to select their own attachment figure and it is possible that the named attachment figure for the momentary measures may not have been the same person considered for the ECR-S¹¹¹. Momentary and trait measures may therefore have tapped into different attachment patterns, affecting results. However, the reasoning behind participants choosing their own attachment figure was to enhance ecological validity as to who participants would naturally approach or seek out for support. Additionally, the research excluded participants without previous romantic relationships, as they would be unable to complete the ECR-S.¹¹¹ However, some people may not have had romantic relationships because of their attachment style (e.g. highly avoidant of forming relationships).

An additional limitation of the study was the small sample size, which may have resulted in insufficient power to detect interaction effects and may explain the reason why trait attachment was not found to moderate associations between stress and changes in proximity seeking. Therefore, this study requires replication with a larger sample. It is also noteworthy that the ECR-S¹¹¹ anxious subscale had poor internal consistency in the current sample, which may have resulted in the attenuation of associations between variables which, together with limited statistical power, may also explain why trait attachment-anxiety was not found to moderate relationships between change in proximity seeking and momentary paranoia. A key limitation of the present research is its correlational nature; thus, we cannot determine whether causal relationships exist between variables studied. Further exploration is warranted regarding the pathways between stress and changes in proximity seeking, in relation to trait attachment, to disentangle the contribution of these different processes to momentary experiences of paranoia, and whether certain experiences are particularly likely to trigger certain processes⁸². This research will require larger sample sizes, longitudinal design, and more complex modelling techniques to allow for the robust appraisal of different pathways from stress and changes in proximity seeking to paranoia. Additionally, it would be useful for future intervention studies to be conducted to examine changes in proximity seeking as a mediator or outcome to help determine if a causal process does exist which would contribute to developments of a unified theory regarding the role of proximity seeking behaviour in relation to stress and momentary experiences of paranoia.

A further limitation of this methodology is that it relies on multilevel modelling of group data which can lead to erroneous conclusions being drawn about relationships between variables and make replication and interpretation of findings across studies difficult¹³⁷. It may therefore be advantageous to visualise the dynamic relationship between the components within individual participants or produce a computational model of individuals to simulate these processes and compare this computational model to data collected from that individual (see Mansell & Huddy¹³⁷ for discussion). Moreover, it has been proposed that computational model testing of individual cases may provide the most direct test of theories^{137,138} and thereby may serve to advance our understanding of the attachment system. The nonclinical nature of the sample limits generalisability of findings to clinical populations. Whilst paranoia has been found to occur across the psychosis continuum,⁹⁴ some would argue that paranoia in a clinical population can be considered qualitatively different from subclinical experiences; therefore, findings should be interpreted with appropriate caution and replicated in a clinical sample in due course. Nevertheless, when treated with appropriate caution, nonclinical samples continue to offer great utility in psychological research. Finally, the sample consider largely of White British, females with high levels of education, thereby limiting generalisability to wider populations.

To our knowledge, this is the first study exploring the temporal relationship between stress, changes in proximity seeking and paranoia. There are several important clinical and theoretical implications. The findings provide support for the notion that attachment is a dynamic, affect regulations system that can be “on-or-offline” at any given time in the presence of relevant contextual cues i.e. stress,¹⁰⁵ and changes in proximity seeking serve as a behavioural indicator of the attachment system coming “online” in the flow of daily life. Results additionally suggest that for individuals with high avoidant-attachment, an online attachment system may exacerbate paranoid ideation due to activation of attachment-related beliefs that one should be fearful of unavailable others and rely on one’s own autonomy¹⁰⁰. Clinicians should therefore adopt a formulation-based approach which considers a person’s attachment history to aid understanding of the role of attachment representations (internal working models about the self and others)¹⁰⁶ in contributing to paranoid thinking, and how these difficulties may be maintained by proximity seeking behaviour. These findings suggest that therapeutic interventions which focus on attachment could be helpful in reducing paranoia. Adopting such an attachment-based approach may allow interventions such as cognitive behavioural therapy to be better

focused around cognitions about others that may follow the attachment system “coming online” such as seeing others as unreliable or hostile, and attempting to reduce behaviours that may maintain paranoid thinking (e.g. withdrawal, avoidance of others). ESM may also have clinical utility in this regard as mobile phone-based experience sampling software could be used to identify triggers or antecedents of the attachment system coming “online” and changes in proximity seeking, in everyday life (i.e. stress reactivity to daily events or hassles). Furthermore, ESM could be harnessed to administer feedback or cue momentary interventions/therapeutic exercises when triggered by increases in attachment-related cognition or large changes in proximity seeking to reduce the likelihood of these experiences resulting in momentary paranoia. Mobile phone applications are already being used to record fluctuations in symptoms, provide real-time feedback and are being used to deliver real-time interventions in this way^{139,140}. Finally, in agreement with previous epidemiological and cross-sectional studies that show an association between attachment insecurity and paranoia^{103,104} the present findings suggest that policies that promote optimal relationships with caregivers in childhood to reduce the likelihood of insecure attachment system forming may help to promote population mental health.

References

1. DeRosse P, Karlsgodt KH. Examining the psychosis continuum. *Curr Behav Neurosci reports*. 2015;2(2):80-89.
2. Van Os J, Linscott RJ, Myin-Germeys I, Delespaul P, Krabbendam L. A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness–persistence–impairment model of psychotic disorder. *Psychol Med*. 2009;39(2):179-195.
3. Poulton R, Caspi A, Moffitt TE, Cannon M, Murray R, Harrington H. Children’s self-reported psychotic symptoms and adult schizophreniform disorder: a 15-year longitudinal study. *Arch Gen Psychiatry*. 2000;57(11):1053-1058.
4. Tien AY. Distribution of hallucinations in the population. *Soc Psychiatry Psychiatr Epidemiol*. 1991;26(6):287-292.
5. Verdoux H, van Os J. Psychotic symptoms in non-clinical populations and the continuum of psychosis. *Schizophr Res*. 2002;54(1-2):59-65.
6. Bentall RP, Fernyhough C. Social predictors of psychotic experiences: specificity and psychological mechanisms. *Schizophr Bull*. 2008;34(6):1012-1020.
7. Freeman D, Garety P. Helping patients with paranoid and suspicious thoughts: a cognitive–behavioural approach. *Adv Psychiatr Treat*. 2006;12(6):404-415.
8. Trower P, Birchwood M, Meaden A, Byrne S, Nelson A, Ross K. Cognitive therapy for command hallucinations: randomised controlled trial. *Br J Psychiatry*. 2004;184(4):312-320.
9. I. M-G, M. O, D. C, J. L, P. D. Experience sampling research in psychopathology: Opening the black box of daily life. *Psychol Med*. 2009;39(9):1533-1547. doi:http://dx.doi.org/10.1017/S0033291708004947
10. J.E. P-C, I. M-G, E. B, et al. Experience sampling research in individuals with mental illness: Reflections and guidance. *ACTA Psychiatr Scand*. 2011;123(1):12-20. doi:http://dx.doi.org/10.1111/j.1600-0447.2010.01596.x
11. Morrison AP. The interpretation of intrusions in psychosis: an integrative cognitive approach to hallucinations and delusions. *Behav Cogn Psychother*. 2001;29(3):257-276.
12. Garety PA, Kuipers E, Fowler D, Freeman D, Bebbington PE. A cognitive model of the positive symptoms of psychosis. *Psychol Med*. 2001;31(2):189-195.
13. Freeman D, Garety PA, Kuipers E, Fowler D, Bebbington PE. A cognitive model of

- persecutory delusions. *Br J Clin Psychol*. 2002;41(4):331-347.
14. Steel C, Fowler D, Holmes EA. Trauma-related intrusions and psychosis: an information processing account. *Behav Cogn Psychother*. 2005;33(2):139-152.
 15. Bentall RP, Corcoran R, Howard R, Blackwood N, Kinderman P. Persecutory delusions: a review and theoretical integration. *Clin Psychol Rev*. 2001;21(8):1143-1192.
 16. Lobban F, Barrowclough C. An Interpersonal CBT Framework for Involving Relatives in Interventions for Psychosis: Evidence Base and Clinical Implications. *Cognit Ther Res*. 2016;40:198-215. doi:10.1007/s10608-015-9731-3
 17. M. C. Validity and reliability of the experience-sampling method. *J Nerv Ment Dis*. 1987;175(9):526-536.
<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed3&NEWS=N&AN=17144371>.
 18. Myin-Germeys I, Delespaul P, van Os J, I. M-G, P. D. The Experience Sampling Method in psychosis research. *Curr Opin Psychiatry*. 2003;16(SUPPL. 2):S33-S38. doi:10.1097/00001504-200304002-00006
 19. M. O, T. K, P. D. Momentary Assessment Research in Psychosis. *Psychol Assess*. 2009;21(4):498-505. doi:<http://dx.doi.org/10.1037/a0017077>
 20. D. K, I. M-G, J. P-C. Mobile assessment guide for research in schizophrenia and severe mental disorders. *Schizophr Bull*. 2012;38(3):386-395. doi:<http://dx.doi.org/10.1093/schbul/sbr186>
 21. Scollon CN, Prieto C-K, Diener E. Experience sampling: promises and pitfalls, strength and weaknesses. In: *Assessing Well-Being*. Springer; 2009:157-180.
 22. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med*. 2009;151(4):264-269.
 23. Harvey AG, Watkins E. *Cognitive Behavioural Processes across Psychological Disorders: A Transdiagnostic Approach to Research and Treatment*. Oxford University Press, USA; 2004.
 24. Landis JR, Koch GG. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*. 1977:363-374.
 25. Plassman BL, Williams JW, Burke JR, Holsinger T, Benjamin S. Systematic review: factors associated with risk for and possible prevention of cognitive decline in later

- life. *Ann Intern Med.* 2010;153(3):182-193.
26. Dudley R, Taylor P, Wickham S, Hutton P. Psychosis, delusions and the “jumping to conclusions” reasoning bias: a systematic review and meta-analysis. *Schizophr Bull.* 2015;42(3):652-665.
 27. Taylor PJ, Hutton P, Wood L. Are people at risk of psychosis also at risk of suicide and self-harm? A systematic review and meta-analysis. *Psychol Med.* 2015;45(5):911-926.
 28. Collip D, Wigman JTW, Myin-Germeys I, et al. From Epidemiology to Daily Life: Linking Daily Life Stress Reactivity to Persistence of Psychotic Experiences in a Longitudinal General Population Study. *PLoS One.* 2013;8(4). doi:10.1371/journal.pone.0062688
 29. Kramer I, Simons CJP, Wigman JTW, et al. Time-Lagged Moment-to-Moment Interplay Between Negative Affect and Paranoia: New Insights in the Affective Pathway to Psychosis. *Schizophr Bull.* 2014;40(2):278-286. doi:10.1093/schbul/sbs194
 30. Little RJA. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc.* 1988;83(404):1198-1202.
 31. Carter L-A, Emsley R. The analysis of experience sampling data. *Exp Sampl Ment Heal Res.* 2019.
 32. D. B-Z, K. E, J. S. Examining a cognitive model of persecutory ideation in the daily life of people with schizophrenia: A computerized experience sampling study. *Schizophr Bull.* 2011;37(6):1248-1256. doi:http://dx.doi.org/10.1093/schbul/sbq041
 33. Nittel CM suppression is associated with state paranoia in psychosis: A experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia, Lincoln TM, Lamster F, et al. Expressive suppression is associated with state paranoia in psychosis: An experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia. *Br J Clin Psychol.* 2018;57(3):291-312. doi:10.1111/bjc.12174
 34. Peters E, Lataster T, Greenwood K, et al. Appraisals, psychotic symptoms and affect in daily life. *Psychol Med.* 2012;42(5):1013-1023. doi:http://dx.doi.org/10.1017/S0033291711001802
 35. V. T, R.P. B, M. O, J. AC, T. van L, J. van O. Emotions, self-esteem, and paranoid episodes: an experience sampling study. *Br J Clin Psychol.* 2011;50(2):178-195.

doi:<http://dx.doi.org/10.1348/014466510X508677>

36. Wigman JTW, van Os J, Borsboom D, et al. Exploring the underlying structure of mental disorders: cross-diagnostic differences and similarities from a network perspective using both a top-down and a bottom-up approach. *Psychol Med*. 2015;45(11):2375-2387. doi:<http://dx.doi.org/10.1017/S0033291715000331>
37. D. B-Z, R. F, S.B. M. self-stigma. *J Dual Diagn*. 2012;8(4):305-314. doi:<http://dx.doi.org/10.1080/15504263.2012.723311>
38. Ben-Zeev D, Morris S, Swendsen J, Granholm E. Predicting the Occurrence, Conviction, Distress, and Disruption of Different Delusional Experiences in the Daily Life of People with Schizophrenia. *Schizophr Bull*. 2012;38(4):826-837. doi:10.1093/schbul/sbq167
39. S.H.-W. S, A.K.C. C, E.R. P, J. S, P.A. G. Moment-to-moment associations between negative affect, aberrant salience, and paranoia. *Cogn Neuropsychiatry*. 2018;23(5):299-306. doi:<http://dx.doi.org/10.1080/13546805.2018.1503080>
40. Klippel A. Modelling the Interplay Between Psychological Processes and Adverse, Stressful Contexts and Experiences in Pathways to Psychosis: An Experience Sampling Study (vol 43, pg 302, 2017). *Schizophr Bull*. 2018;44(5):1159-1165. doi:10.1093/schbul/sby068
41. Klippel A, Viechtbauer W, Reininghaus U, et al. The Cascade of Stress: A Network Approach to Explore Differential Dynamics in Populations Varying in Risk for Psychosis. *Schizophr Bull*. 2018;44(2):328-337. doi:10.1093/schbul/sbx037
42. K. K, B. S, Lincoln T. AO - Krkovic KO <http://orcid.org/000.-0002-1961-9810>. An experience sampling study on the nature of the interaction between traumatic experiences, negative affect in everyday life, and threat beliefs. *Schizophr Res*. 2018;201:381-387. doi:<http://dx.doi.org/10.1016/j.schres.2018.05.030>
43. K. K, S. K, Lincoln T.M. AO - Krkovic KO <http://orcid.org/000.-0002-1961-9810>. Emotion regulation as a moderator of the interplay between self-reported and physiological stress and paranoia. *Eur Psychiatry*. 2018;49:43-49. doi:<http://dx.doi.org/10.1016/j.eurpsy.2017.12.002>
44. Ludtke T, Kriston L, Schroder J, et al. Negative affect and a fluctuating jumping to conclusions bias predict subsequent paranoia in daily life: An online experience sampling study. *J Behav Ther Exp Psychiatry*. 2017;56(SI):106-112. doi:<http://dx.doi.org/10.1016/j.jbtep.2016.08.014>
45. Buckley PF, Miller BJ, Lehrer DS, Castle DJ. Psychiatric comorbidities and

- schizophrenia. *Schizophr Bull.* 2008;35(2):383-402.
46. van Rossum I, Dominguez M-G, Lieb R, Wittchen H-U, van Os J. Affective dysregulation and reality distortion: a 10-year prospective study of their association and clinical relevance. *Schizophr Bull.* 2009;37(3):561-571.
 47. Varese F, Udachina A, Myin-Germeys I, Oorschot M, Bentall RP. The relationship between dissociation and auditory verbal hallucinations in the flow of daily life of patients with psychosis. *PSYCHOSIS-PSYCHOLOGICAL Soc Integr APPROACHES.* 2011;3(1):14-28. doi:10.1080/17522439.2010.548564
 48. Hartley S, Haddock G, e Sa D, et al. An experience sampling study of worry and rumination in psychosis. *Psychol Med.* 2014;44(8):1605-1614. doi:10.1017/S0033291713002080
 49. Hartley S, Haddock G, e Sa D, Emsley R, Barrowclough C. The influence of thought control on the experience of persecutory delusions and auditory hallucinations in daily life. *Behav Res Ther.* 2015;65:1-4. doi:10.1016/j.brat.2014.12.002
 50. Palmier-Claus JE, Dunn G, Taylor H, et al. Cognitive-self consciousness and metacognitive beliefs: Stress sensitization in individuals at ultra-high risk of developing psychosis. *Br J Clin Psychol.* 2013;52(1):26-41. doi:10.1111/j.2044-8260.2012.02043.x
 51. U. R, M.J. K, L. V, et al. Stress sensitivity, aberrant salience, and threat anticipation in early psychosis: An experience sampling study. *Schizophr Bull.* 2016;42(3):712-722. doi:http://dx.doi.org/10.1093/schbul/sbv190
 52. A. U, V. T, I. M-G, S. F, A. O. Understanding the relationships between self-esteem, experiential avoidance, and paranoia: Structural equation modelling and experience sampling studies. *J Nerv Ment Dis.* 2009;197(9):661-668. doi:http://dx.doi.org/10.1097/NMD.0b013e3181b3b2ef
 53. A. U, F. V, I. M-G. The role of experiential avoidance in paranoid delusions: an experience sampling study. *Br J Clin Psychol.* 2014;53(4):422-432. doi:http://dx.doi.org/10.1111/bjc.12054
 54. Hayes SC, Strosahl K, Wilson KG, et al. Measuring experiential avoidance: A preliminary test of a working model. *Psychol Rec.* 2004;54(4):553-578.
 55. Kapur S. Psychosis as a state of aberrant salience: a framework linking biology, phenomenology, and pharmacology in schizophrenia. *Am J Psychiatry.* 2003;160(1):13-23.

56. Freeman D, Garety PA. Worry, worry processes and dimensions of delusions: an exploratory investigation of a role for anxiety processes in the maintenance of delusional distress. *Behav Cogn Psychother*. 1999;27(1):47-62.
57. Jones SR, Fernyhough C. Rumination, reflection, intrusive thoughts, and hallucination-proneness: towards a new model. *Behav Res Ther*. 2009;47(1):54-59.
58. I. M-G, Ph. D, Myin-Germeys I, Delespaul P, van Os J. Behavioural sensitization to daily life stress in psychosis. *Psychol Med*. 2005;35(5):733-741.
doi:10.1017/S0033291704004179
59. Huq SF, Garety PA, Hemsley DR. Probabilistic judgements in deluded and non-deluded subjects. *Q J Exp Psychol Sect A*. 1988;40(4):801-812.
60. Collip I, Oorschot M, Thewissen V, et al. Social world interactions: how company connects to paranoia. *Psychol Med*. 2011;41(5):911-921.
doi:10.1017/S0033291710001558
61. Lardinois M, Lataster T, Mengelers R, et al. Childhood trauma and increased stress sensitivity in psychosis. *ACTA Psychiatr Scand*. 2011;123(1):28-35.
doi:http://dx.doi.org/10.1111/j.1600-0447.2010.01594.x
62. Palmier-Claus JE, Dunn G, Lewis SW, J.E. P-C, G. D. Emotional and symptomatic reactivity to stress in individuals at ultra-high risk of developing psychosis. *Psychol Med*. 2012;42(5):1003-1012. doi:http://dx.doi.org/10.1017/S0033291711001929
63. Weijers J, Viechtbauer W, Eurelings-Bontekoe E, Selten J-P. Reported Childhood Abuse and Stress Reactivity in Psychosis: A Conceptual Replication and Exploration of Statistical Approaches. *Front PSYCHIATRY*. 2018;9.
doi:10.3389/fpsyt.2018.00639
64. Barrantes-Vidal N, Chun CA, Myin-Germeys I, Kwapil TR. Psychometric Schizotypy Predicts Psychotic-Like, Paranoid, and Negative Symptoms in Daily Life. *J Abnorm Psychol*. 2013;122(4):1077-1087. doi:10.1037/a0034793
65. P. C-N, T. S, S. B, M. M, I. M-G, T.R. K. Impact of Adverse Childhood Experiences on Psychotic-Like Symptoms and Stress Reactivity in Daily Life in Nonclinical Young Adults. *PLoS One*. 2016;11(4):e0153557.
doi:http://dx.doi.org/10.1371/journal.pone.0153557
66. I. M-G, N.A. N, Myin-Germeys I, Nicolson NA, Delespaul P. The context of delusional experiences in the daily life of patients with schizophrenia. *Psychol Med*. 2001;31(3):489-498.
<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed7&NEWS=>

N&AN=32294047.

67. H. V, M. H, M. T, et al. Social environments and daily life occurrence of psychotic symptoms - An experience sampling test in a non-clinical population. *Soc Psychiatry Psychiatr Epidemiol*. 2003;38(11):654-661. doi:10.1007/s00127-003-0702-8
68. Vasconcelos E Sa D, Wearden A, Hartley S, et al. Expressed Emotion and behaviourally controlling interactions in the daily life of dyads experiencing psychosis. *Psychiatry Res*. 2016;245:406-413.
doi:http://dx.doi.org/10.1016/j.psychres.2016.08.060
69. Sitko K, Varese F, Sellwood W, Hammond A, Bentall R. The dynamics of attachment insecurity and paranoid thoughts: An experience sampling study. *PSYCHIATRY Res*. 2016;246:32-38. doi:10.1016/j.psychres.2016.08.057
70. V. T, R.P. B, T. L, J. van O. Fluctuations in Self-Esteem and Paranoia in the Context of Daily Life. *J Abnorm Psychol*. 2008;117(1):143-153.
doi:http://dx.doi.org/10.1037/0021-843X.117.1.143
71. Freeman D, Garety PA. Connecting neurosis and psychosis: the direct influence of emotion on delusions and hallucinations. *Behav Res Ther*. 2003;41(8):923-947.
72. Berry K, Bucci S. What does attachment theory tell us about working with distressing voices? *Psychosis*. 2016;8(1):60-71.
73. N. B, R. E, F. L, <http://orcid.org/0000-0001-6594-4350> BSAO-BN. O <http://orcid.org/000.-0001-7414-1541> AO-BS. O <http://orcid.org/000.-0002-6197-5333> AO-ER. O <http://orcid.org/000.-0002-1218-675X> AO-LF. O. Social media and its relationship with mood, self-esteem and paranoia in psychosis. *Acta Psychiatr Scand*. 2018;138(6):558-570. doi:http://dx.doi.org/10.1111/acps.12953
74. I. M-G. Stress-reactivity in psychosis: Evidence for an affective pathway to psychosis. *Clin Psychol Rev*. 2007;27(4):409-424.
doi:http://dx.doi.org/10.1016/j.cpr.2006.09.005
75. Zubin J, Spring B. Vulnerability: a new view of schizophrenia. *J Abnorm Psychol*. 1977;86(2):103.
76. Faught B, Colby KM, Parkison RC. *The Interaction of Inferences, Affects, and Intentions, in a Model of Paranoia*. STANFORD UNIV CA DEPT OF COMPUTER SCIENCE; 1974.
77. Melo SS, Taylor JL, Bentall RP. Poor me versus bad me paranoia and the instability of persecutory ideation. *Psychol Psychother Theory, Res Pract*. 2006;79(2):271-287.

78. Thewissen V, Myin-Germeys I, Bentall R, de Graaf R, Vollebergh W, van Os J. Instability in self-esteem and paranoia in a general population sample. *Soc Psychiatry Psychiatr Epidemiol*. 2007;42(1):1-5.
79. Hoertel N, Le Strat Y, Lavaud P, Dubertret C, Limosin F. Generalizability of clinical trial results for bipolar disorder to community samples: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry*. 2013.
80. Sears DO. College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *J Pers Soc Psychol*. 1986;51(3):515.
81. Van Lange PAM, Schippers M, Balliet D. Who volunteers in psychology experiments? An empirical review of prosocial motivation in volunteering. *Pers Individ Dif*. 2011;51(3):279-284.
82. Bentall RP, de Sousa P, Varese F, et al. From adversity to psychosis: pathways and mechanisms from specific adversities to specific symptoms. *Soc Psychiatry Psychiatr Epidemiol*. 2014;49(7):1011-1022.
83. Barlow DH, Allen LB, Choate ML. Toward a unified treatment for emotional disorders. *Behav Ther*. 2004;35(2):205-230.
84. Meichenbaum DH, Deffenbacher JL. Stress inoculation training. *Couns Psychol*. 1988;16(1):69-90.
85. Wells A, Fisher P, Myers S, Wheatley J, Patel T, Brewin CR. Metacognitive therapy in recurrent and persistent depression: A multiple-baseline study of a new treatment. *Cognit Ther Res*. 2009;33(3):291-300.
86. Wells A. A metacognitive model and therapy for generalized anxiety disorder. *Clin Psychol Psychother An Int J Theory Pract*. 1999;6(2):86-95.
87. Wells A. Detached mindfulness in cognitive therapy: A metacognitive analysis and ten techniques. *J Ration Cogn Ther*. 2005;23(4):337-355.
88. Wells A, Matthews G. Modelling cognition in emotional disorder: The S-REF model. *Behav Res Ther*. 1996;34(11-12):881-888.
89. Myin-Germeys I, Birchwood M, Kwapil T. From Environment to Therapy in Psychosis: A Real-World Momentary Assessment Approach. *Schizophr Bull*. 2011;37(2):244-247. doi:10.1093/schbul/sbq164
90. E. G, D. B-Z, P.C. L, K.R. B. Mobile assessment and treatment for schizophrenia (MATS): A pilot trial of an interactive text-messaging intervention for medication adherence, socialization, and auditory hallucinations. *Schizophr Bull*.

2012;38(3):414-425. doi:http://dx.doi.org/10.1093/schbul/sbr155

91. Fenigstein A, Levine MP. Self-attention, concept activation, and the causal self. *J Exp Soc Psychol.* 1984;20(3):231-245.
92. Moutoussis M, Williams J, Dayan P, Bentall RP. Persecutory delusions and the conditioned avoidance paradigm: towards an integration of the psychology and biology of paranoia. *Cogn Neuropsychiatry.* 2007;12(6):495-510.
93. Freeman D, Garety P. Advances in understanding and treating persecutory delusions: a review. *Soc Psychiatry Psychiatr Epidemiol.* 2014;49(8):1179-1189.
94. Van Os J, Verdoux H, Maurice-Tison S, et al. Self-reported psychosis-like symptoms and the continuum of psychosis. *Soc Psychiatry Psychiatr Epidemiol.* 1999;34(9):459-463.
95. Bowlby J. Attachment And Loss. Vol. 2: Separation: Anxiety And An: Evt. 1973.
96. Berry K, Band R, Corcoran R, Barrowclough C, Wearden A. Attachment styles, earlier interpersonal relationships and schizotypy in a non-clinical sample. *Psychol Psychother Theory, Res Pract.* 2007;80(4):563-576.
97. Main M, Kaplan N, Cassidy J. Security in infancy, childhood, and adulthood: A move to the level of representation. *Monogr Soc Res child Dev.* 1985.
98. Ainsworth MDS, Blehar M, Waters E, Wall S. Patterns of attachment: Observations in the Strange Situation and at home. *Hillsdale, NJ Erlbaum.* 1978.
99. Hazan C, Shaver P. Romantic love conceptualized as an attachment process. *J Pers Soc Psychol.* 1987;52(3):511.
100. Mikulincer M, Shaver PR, Pereg D. Attachment Theory and Affect Regulation: The Dynamics, Development, and Cognitive Consequences of Attachment-Related Strategies. *Motiv Emot.* 2003;27(2):77-102. doi:10.1023/A:1024515519160
101. Mikulincer M, Shaver PR, Bar-On N, Ein-Dor T. The pushes and pulls of close relationships: Attachment insecurities and relational ambivalence. *J Pers Soc Psychol.* 2010;98(3):450.
102. Purnell C. Childhood trauma and adult attachment. *Healthc Couns Psychother J.* 2010;10(2):1-7.
103. Wickham S, Sitko K, Bentall RP. Insecure attachment is associated with paranoia but not hallucinations in psychotic patients: the mediating role of negative self-esteem. *Psychol Med.* 2015;45(7):1495-1507.
104. Pickering L, Simpson J, Bentall RP. Insecure attachment predicts proneness to paranoia but not hallucinations. *Pers Individ Dif.* 2008;44(5):1212-1224.

105. Pierce T, Lydon JE. Global and specific relational models in the experience of social interactions. *J Pers Soc Psychol.* 2001;80(4):613.
106. Scharfe E, Bartholomew KIM. Reliability and stability of adult attachment patterns. *Pers Relatsh.* 1994;1(1):23-43.
107. Waters E, Merrick S, Treboux D, Crowell J, Albersheim L. Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Dev.* 2000;71(3):684-689.
108. Baldwin MW, Fehr B. On the instability of attachment style ratings. *Pers Relatsh.* 1995;2(3):247-261.
109. Csikszentmihalyi M, Larson R. Validity and reliability of the experience-sampling method. In: *Flow and the Foundations of Positive Psychology.* Springer; 2014:35-54.
110. Freeman D, Evans N, Lister R, Antley A, Dunn G, Slater M. Height, social comparison, and paranoia: an immersive virtual reality experimental study. *Psychiatry Res.* 2014;218(3):348-352.
111. Wei M, Russell DW, Mallinckrodt B, Vogel DL. The Experiences in Close Relationship Scale (ECR)-short form: Reliability, validity, and factor structure. *J Pers Assess.* 2007;88(2):187-204.
112. Trinke SJ, Bartholomew K. Hierarchies of attachment relationships in young adulthood. *J Soc Pers Relat.* 1997;14(5):603-625.
113. Doherty NA, Feeney JA. The composition of attachment networks throughout the adult years. *Pers Relatsh.* 2004;11(4):469-488.
114. Fenigstein A, Venable PA. Paranoia and self-consciousness. *J Pers Soc Psychol.* 1992;62(1):129.
115. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther.* 1995;33(3):335-343.
116. Allan S, Gilbert P. A social comparison scale: Psychometric properties and relationship to psychopathology. *Pers Individ Dif.* 1995;19(3):293-299.
117. Snijders TAB, Bosker RJ. An introduction to basic and advanced multilevel modeling. *Sage, London WONG, GY, y MASON, WM Hierarchical Logist Regression Model Multilevel Anal J Am Stat Assoc.* 1999;80(5):13-524.
118. Snijders T. Longitudinal data. In «Multilevel analysis: An introduction to basic and advanced multilevel modeling. Ed Snijders and Bosker. 166-200. 2003.

119. Kreft IGG. Are multilevel techniques necessary? An overview, including simulation studies. *Unpubl manuscript, Calif State Univ Los Angeles*. 1996.
120. Kwok O-M, Underhill AT, Berry JW, Luo W, Elliott TR, Yoon M. Analyzing longitudinal data with multilevel models: An example with individuals living with lower extremity intra-articular fractures. *Rehabil Psychol*. 2008;53(3):370.
121. StataCorp LP. STATA 12 [Computer software]. *Coll Station TX StataCorp LP*. 2015.
122. Hox JJ, Moerbeek M, Van de Schoot R. *Multilevel Analysis: Techniques and Applications*. Routledge; 2017.
123. Schwartz JE, Stone AA. Strategies for analyzing ecological momentary assessment data. *Heal Psychol*. 1998;17(1):6.
124. Tabachnick BG, Fidell LS. *Using multivariate statistics* Boston. *MA Allyn Bacon*. 2007;5:2007.
125. Höhn P, Menne-Lothmann C, Peeters F, et al. Moment-to-Moment Transfer of Positive Emotions in Daily Life Predicts Future Course of Depression in Both General Population and Patient Samples. *PLoS One*. 2013;8(9).
doi:10.1371/journal.pone.0075655
126. Watson D, Clark LA. Measurement and Mismeasurement of Mood: Recurrent and Emergent issues. *J Pers Assess*. 1997;68(2):267-296.
doi:10.1207/s15327752jpa6802_4
127. Schmukle SC, Egloff B, Burns LR. The relationship between positive and negative affect in the Positive and Negative Affect Schedule. *J Res Pers*. 2002;36(5):463-475.
128. Diener E, Emmons RA. The independence of positive and negative affect. *J Pers Soc Psychol*. 1984;47(5):1105.
129. Ainsworth MD, Wittig B. Attachment, exploration, and separation: illustrated by the behavior of one-year-olds in a strange situation. *Determ infant Behav*. 1969;4:113-136.
130. Mikulincer M, Shaver P. Mental representations and attachment security. *Interpers Cogn*. 2005:233-266.
131. Collins NL, Allard LM. Cognitive representations of attachment: The content and function of working models. *Blackwell Handb Soc Psychol Interpers Process*. 2001;2:60-85.
132. Collins NL, Read SJ. Cognitive representations of attachment: The structure and

- function of working models. 1994.
133. Mikulincer M, SHAVER PR. An attachment perspective on psychopathology. *World Psychiatry*. 2012;11(1):11-15.
 134. Garety P, Waller H, Emsley R, et al. Cognitive mechanisms of change in delusions: an experimental investigation targeting reasoning to effect change in paranoia. *Schizophr Bull*. 2014;41(2):400-410.
 135. Plotka R. Adult Attachment Interview (AAI). *Encycl Child Behav Dev*. 2011:52-54.
 136. George C, Kaplan N, Main M. Attachment interview for adults. *Unpubl manuscript, Univ California, Berkeley*. 1985.
 137. Huddy V. The Assessment and Modeling of Perceptual Control A Transformation in Research Methodology to Address the Replication Crisis Warren Mansell School of Health Sciences, University of Manchester, UK. 2018.
 138. Carey TA, Tai SJ, Mansell W, Huddy V, Griffiths R, Marken RS. Improving professional psychological practice through an increased repertoire of research methodologies: Illustrated by the development of MOL. *Prof Psychol Res Pract*. 2017;48(3):175.
 139. Palmier-Claus JE, Rogers A, Ainsworth J, et al. Integrating mobile-phone based assessment for psychosis into people's everyday lives and clinical care: a qualitative study. *BMC Psychiatry*. 2013;13(1):34.
 140. Bucci S, Barrowclough C, Ainsworth J, et al. Actissist: proof-of-concept trial of a theory-driven digital intervention for psychosis. *Schizophr Bull*. 2018;44(5):1070-1080.
 141. Myin-Germeys I, Delespaul PAEG, van Os J, I. M-G, P.A.E.G. D. Experience sampling research in psychosis. A review. Aleman Appelo, Barge-Schaapveld, Barge-Schaapveld, Bebbington, Berenbaum, Brett Jones, Cannon, Clark, Csikszentmihalyi, Debowska, Delespaul, Delespaul, Dijkman-Caes, Fowler, Garety, Hammen, Heinrichs, Herbener, Krabbendam, Krmg, Larson, Lukoff, Mohamed, A, ed. *Tijdschr Psychiatr*. 2003;45(3):131-140.
<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=36323604>.
 142. Rosenthal R. The file drawer problem and tolerance for null results. *Psychol Bull*. 1979;86(3):638.
 143. Hopewell S, Clarke M, Askie L. Reporting of trials presented in conference abstracts needs to be improved. *J Clin Epidemiol*. 2006;59(7):681-684.

144. Jadad AR, Moher M, Browman GP, et al. Systematic reviews and meta-analyses on treatment of asthma: critical evaluation. *Bmj*. 2000;320(7234):537-540.
145. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med*. 2009;6(7):e1000100.
146. Greenland S. Invited commentary: a critical look at some popular meta-analytic methods. *Am J Epidemiol*. 1994;140(3):290-296.
147. Blundell M. Understanding and synthesizing my numerical data. *Doing a Syst Rev student's Guid Los Angeles Sage*. 2014.
148. Bentall RP, Varese F. A level playing field?: Are bio-genetic and psychosocial studies evaluated by the same standards? 2012.
149. Rainie L, Zickuhr K, Purcell K, Madden M, Brenner J. The Rise of E-Reading. *Pew Internet Am Life Proj*. 2012.
150. Coyne SM, Stockdale L, Busby D, Iverson B, Grant DM. "I luv u:)": A descriptive study of the media use of individuals in romantic relationships. *Fam Relat*. 2011;60(2):150-162.
151. Morey JN, Gentzler AL, Creasy B, Oberhauser AM, Westerman D. Young adults' use of communication technology within their romantic relationships and associations with attachment style. *Comput Human Behav*. 2013;29(4):1771-1778.
152. Bartholomew K, Horowitz LM. Attachment styles among young adults: a test of a four-category model. *J Pers Soc Psychol*. 1991;61(2):226.
153. Brennan KA, Clark CL, Shaver PR. Self-report measurement of adult attachment: An integrative overview. 1998.
154. Fernandez C V, Kodish E, Weijer C. Informing study participants of research results: an ethical imperative. *IRB Ethics Hum Res*. 2003;25(3):12-19.

Table 1: Participant Demographics and Scores on Baseline Measures

Demographics/Variables	n	%	M (SD)	Range
Demographics				
Age (years)	60	-	19.6 (1.5)	18-26
Gender:				
Male	9	15	-	-
Female	51	85	-	-
Ethnicity:				
White British	41	68.3	-	-
White Other	7	11.7	-	-
Indian	1	1.7	-	-
Pakistani	1	1.7	-	-
Chinese	7	11.7	-	-
Other Asian	2	3.3	-	-
Mixed	1	1.7	-	-
Named Attachment Figure:				
Mother	14	23.3	-	-
Father	1	1.7	-	-
Grandmother	1	1.7	-	-
Girlfriend	5	8.3	-	-
Boyfriend	27	45	-	-
Sister	4	6.7	-	-
Friend	8	13.3	-	-

Variables

ECR-S:				
Attachment Avoidance	60	-	14.4 (5.6)	6-27
Attachment Anxiety	60	-	23.4 (5.5)	11-36
Paranoia Scale Total	60	-	43.6 (12.1)	26-80
DASS-21:				
Stress	60	-	8.4 (4.4)	1-20
Depression	60	-	4.6 (3.9)	0-20
Anxiety	60	-	4.7 (4.0)	0-17
SCS Total	60	-	58.8 (13.9)	26-85

Note. M= Mean; SD= Standard Deviation; ECR-S= Experience in Close Relationship Scale-Short Form; DASS-21= Depression Anxiety Stress Scale-21; SCS= Social Comparison Scale.

Table 2: Effect of Stress on Level of Proximity Seeking and Moderation Effects of Person-level Attachment Style

Independent Variables	β	P-value	95% CI
Model 1			
Stress lagged t-1	-0.020	0.623	-0.099 to 0.060
Model 2			
Stress lagged t-1	-0.021	0.606	-0.100 to 0.059
Trait depression	-0.073	0.351	-0.226 to 0.080
Trait anxiety	0.074	0.317	-0.071 to 0.219
Trait social comparison	-0.030	0.108	-0.067 to 0.007
Model 3			
Event-related stress	-0.056	0.040*	-0.110 to -0.002
Event-related stress squared	0.089	<.001**	0.062 to 0.116
Model 4			
Event-related stress	-0.056	0.040*	-0.110 to -0.002
Event-related stress squared	0.089	<.001**	0.062 to 0.116
Trait depression	-0.090	0.291	-0.256 to 0.077
Trait anxiety	0.078	0.334	-0.080 to 0.235
Trait social comparison	-0.024	0.249	-0.064 to 0.017
Model 5			

Stress lagged t-1	-0.020	0.625	-0.099 to 0.060
Trait anxious attachment	0.016	0.758	-0.085 to 0.116
Stress lagged t-1 x trait anxious attachment	0.007	0.317	-0.007 to 0.020

Model 6

Stress lagged t-1	-0.020	0.618	-0.100 to 0.059
Trait anxious attachment	0.033	0.559	-0.077 to 0.142
Stress lagged t-1 x trait anxious attachment	0.007	0.319	-0.007 to 0.020
Trait depression	-0.100	0.223	-0.260 to 0.061
Trait anxiety	0.056	0.457	-0.091 to 0.203
Trait social comparison	-0.031	0.095	-0.068 to 0.005

Model 7

Stress lagged t-1	-0.018	0.666	-0.097 to 0.062
Trait avoidant attachment	-0.090	0.076	-0.189 to 0.009
Stress lagged t-1 x trait avoidant attachment	0.008	0.262	-0.006 to 0.023

Model 8

Stress lagged t-1	-0.019	0.640	-0.099 to 0.061
Trait avoidant attachment	-0.098	0.050	-0.196 to 0.000
Stress lagged t-1 x trait avoidant attachment	0.008	0.270	-0.006 to 0.023
Trait depression	-0.061	0.429	-0.211 to 0.090
Trait anxiety	0.083	0.254	-0.059 to 0.224

Trait social comparison	-0.032	0.080	-0.069 to 0.004
-------------------------	--------	-------	-----------------

Model 9

Event-related stress	-0.056	0.042*	-0.109 to -0.002
Event-related stress squared	0.089	<.001**	0.063 to 0.116
Trait anxious attachment	0.036	0.484	-0.065 to 0.138
Event-related stress x trait anxious attachment	0.003	0.561	-0.006 to 0.011
Event-related stress squared x trait anxious attachment	0.001	0.583	-0.003 to 0.006

Model 10

Event-related stress	-0.056	0.041*	-0.110 to -0.002
Event-related stress squared	0.090	<.001**	0.063 to 0.116
Trait anxious attachment	0.059	0.312	-0.055 to 0.172
Event-related stress x trait anxious attachment	0.003	0.567	-0.006 to 0.011
Event-related stress squared x trait anxious attachment	0.001	0.580	-0.003 to 0.006
Trait depression	-0.122	0.168	-0.296 to 0.052
Trait anxiety	0.059	0.465	-0.100 to 0.218
Trait social comparison	-0.025	0.217	-0.065 to 0.015

Model 11

Event-related stress	-0.054	0.049*	-0.108 to -0.000
Event-related stress squared	0.089	<.001**	0.062 to 0.116
Trait avoidant attachment	-0.076	0.131	-0.176 to 0.023

Event-related stress x trait avoidant attachment	-0.001	0.804	-0.011 to 0.008
Event-related stress squared x trait avoidant attachment	0.002	0.357	-0.002 to 0.007

Model 12

Event-related stress	-0.054	0.049*	-0.108 to -0.000
Event-related stress squared	0.089	<.001**	0.062 to 0.116
Trait avoidant attachment	-0.082	0.107	-0.181 to 0.018
Event-related stress x trait avoidant attachment	-0.001	0.809	-0.011 to 0.008
Event-related stress squared x trait avoidant attachment	0.002	0.366	-0.003 to 0.007
Trait depression	-0.075	0.374	-0.239 to 0.090
Trait anxiety	0.083	0.290	-0.071 to 0.238
Trait social comparison	-0.026	0.194	-0.066 to 0.013

Note. *<.05; **<.025; β = unstandardised coefficient values; SE= standard error of the coefficient; 95% CI = 95% confidence interval for the coefficient.

Table 3: Effect of Stress on Change in Proximity Seeking and Moderation Effects of Person-level Attachment Style

Independent Variables	β	P-value	95% CI
Model 1			
Stress lagged t-1	0.089	0.017**	0.016 to 0.162
Model 2			
Stress lagged t-1	0.087	0.020**	0.013 to 0.160
Trait depression	-0.003	0.940	-0.083 to 0.077
Trait anxiety	0.032	0.404	-0.044 to 0.108
Trait social comparison	-0.005	0.620	-0.024 to 0.014
Model 3			
Event-related stress	-0.066	0.022**	-0.122 to -0.010
Model 4			
Event-related stress	-0.065	0.024**	-0.121 to -0.009
Trait depression	-0.004	0.924	-0.085 to 0.077
Trait anxiety	0.035	0.370	-0.042 to 0.112
Trait social comparison	-0.005	0.598	-0.025 to 0.014
Model 5			
Stress lagged t-1	0.089	0.017**	0.016 to 0.162
Trait anxious attachment	-0.006	0.833	-0.065 to 0.053

Stress lagged t-1 x trait anxious attachment	0.007	0.284	-0.006 to 0.019
--	-------	-------	-----------------

Model 6

Stress lagged t-1	0.087	0.019**	0.014 to 0.160
Trait anxious attachment	-0.010	0.753	-0.073 to 0.053
Stress lagged t-1 x trait anxious attachment	0.006	0.319	-0.006 to 0.019
Trait depression	-0.008	0.853	-0.092 to 0.076
Trait anxiety	0.027	0.491	-0.050 to 0.105
Trait social comparison	-0.005	0.619	-0.024 to 0.014

Model 7

Stress lagged t-1	0.091	0.014**	0.018 to 0.164
Trait avoidant attachment	-0.041	0.182	-0.100 to 0.019
Stress lagged t-1 x trait avoidant attachment	0.009	0.198	-0.005 to 0.022

Model 8

Stress lagged t-1	0.089	0.017**	0.016 to 0.162
Trait avoidant attachment	-0.045	0.142	-0.104 to 0.015
Stress lagged t-1 x trait avoidant attachment	0.009	0.205	-0.005 to 0.022
Trait depression	-0.001	0.971	-0.081 to 0.078
Trait anxiety	0.036	0.353	-0.040 to 0.111
Trait social comparison	-0.005	0.609	-0.024 to 0.014

Model 9

Event-related stress	-0.085	0.007**	-0.147 to -0.023
Trait anxious attachment	0.010	0.713	-0.042 to 0.061
Event-related stress x trait anxious attachment	-0.002	0.660	-0.012 to 0.008

Model 10

Event-related stress	-0.085	0.007**	-0.146 to -0.023
Trait anxious attachment	0.003	0.927	-0.055 to 0.061
Event-related stress x trait anxious attachment	-0.002	0.680	-0.012 to 0.008
Trait depression	-0.008	0.856	-0.093 to 0.077
Trait anxiety	0.033	0.406	-0.045 to 0.112
Trait social comparison	-0.005	0.588	-0.025 to 0.014

Model 11

Event-related stress	-0.085	0.007**	-0.147 to -0.023
Trait avoidant attachment	-0.025	0.332	-0.075 to 0.025
Event-related stress x trait avoidant attachment	-0.008	0.169	-0.019 to 0.003

Model 12

Event-related stress	-0.084	0.008**	-0.146 to -0.022
Trait avoidant attachment	-0.029	0.254	-0.080 to 0.021
Event-related stress x trait avoidant attachment	-0.008	0.175	-0.019 to 0.003
Trait depression	0.001	0.987	-0.080 to 0.081
Trait anxiety	0.035	0.363	-0.041 to 0.111

Trait social comparison	-0.006	0.555	-0.025 to 0.013
-------------------------	--------	-------	-----------------

Note. * $<.05$; ** $<.025$; β = unstandardised coefficient values; SE= standard error of the coefficient; 95% CI = 95% confidence interval for the coefficient.

Table 4: Effect of Change in Proximity Seeking on Level of Paranoia and Moderation Effects of Person-level Attachment Style

Independent Variables	β	P-value	95% CI
Model 1			
Change in proximity seeking	-0.009	0.629	-0.047 to 0.029
Model 2			
Change in proximity seeking	-0.009	0.650	-0.047 to 0.029
Trait depression	0.368	<.001*	0.188 to 0.547
Trait anxiety	0.114	0.192	-0.057 to 0.285
Trait social comparison	-0.012	0.576	-0.056 to 0.031
Gender	0.277	0.741	-1.368 to 1.923
Model 3			
Change in proximity seeking	-0.009	0.627	-0.047 to 0.029
Trait anxious attachment	0.180	<.001*	0.054 to 0.306
Change in proximity seeking x trait anxious attachment	0.001	0.789	-0.006 to 0.008
Model 4			
Change in proximity seeking	-0.009	0.646	-0.047 to 0.029
Trait anxious attachment	0.056	0.398	-0.073 to 0.184
Change in proximity seeking x trait anxious attachment	0.001	0.829	-0.006 to 0.008
Trait depression	0.341	<.001*	0.153 to 0.529
Trait anxiety	0.931	0.300	-0.083 to 0.269

Trait social comparison	-0.013	0.554	-0.056 to 0.030
Gender	0.523	0.553	-1.205 to 2.251
Model 5			
Change in proximity seeking	-0.002	0.913	-0.041 to 0.036
Trait avoidant attachment	0.073	0.273	-0.057 to 0.203
Change in proximity seeking x trait avoidant attachment	0.007	0.042	0.000 to 0.144
Model 6			
Change in proximity seeking	-0.002	0.930	-0.040 to 0.037
Trait avoidant attachment	0.015	0.779	-0.092 to 0.123
Change in proximity seeking x trait avoidant attachment	0.007	0.044*	0.000 to 0.144
Trait depression	0.363	<.001*	0.184 to 0.542
Trait anxiety	0.107	0.217	-0.063 to 0.277
Trait social comparison	-0.012	0.598	-0.055 to 0.032
Gender	0.287	0.732	-1.353 to 1.926

Note. *<.05; β = unstandardised coefficient values; SE= standard error of the coefficient; 95% CI = 95% confidence interval for the coefficient

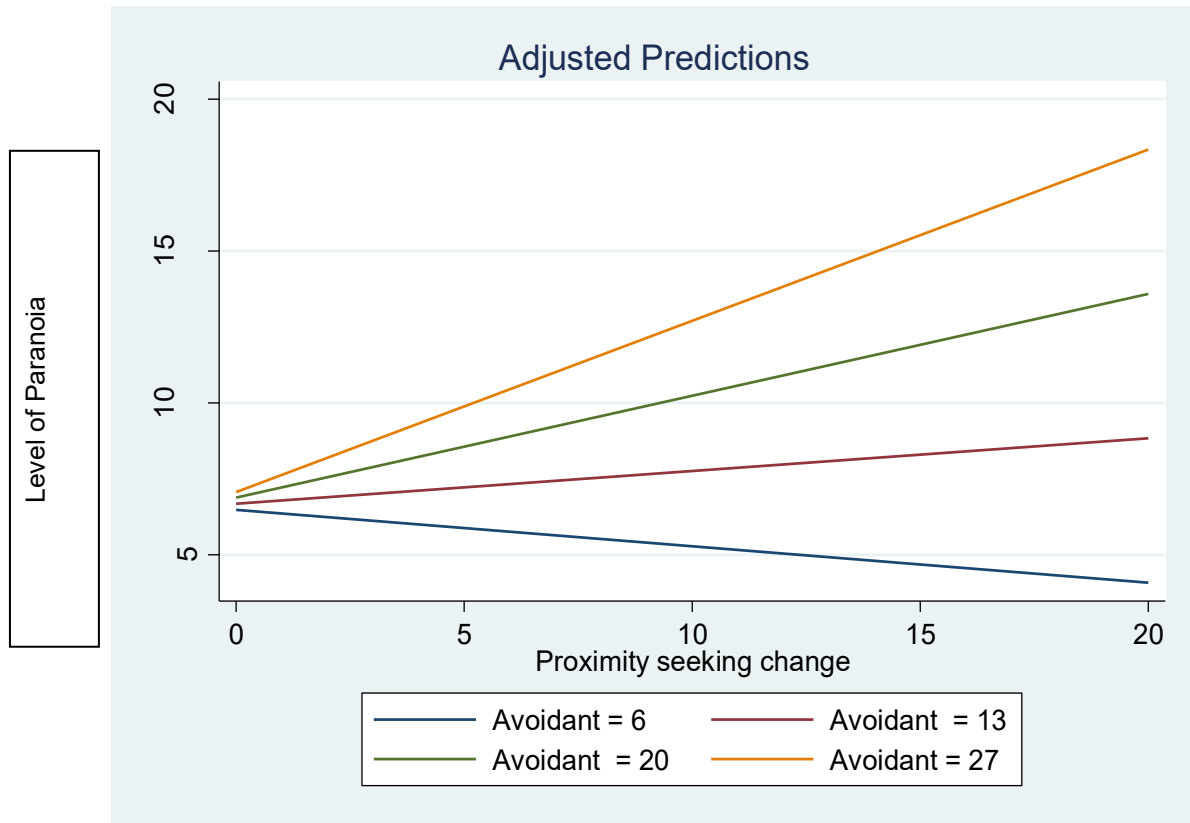


Figure 1. Margin plot illustrating the moderating effect of avoidant attachment on the relationship between change in proximity seeking and level of paranoia. The coloured lines represent the relationship at different levels of avoidant attachment score.

Paper 3. Critical reflection

Word count: 3,194 (excluding references)

Introduction

This paper presents a critical appraisal of the research conducted within the current thesis. Consideration of the planning, implementation and interpretation of the systematic review and empirical study will be discussed, with reference to the strengths and limitations of the research process. Finally, personal reflections regarding the thesis process will be offered.

Systematic literature review (Paper 1)

Rationale and review process

Paper one reports a systematic review of the Experience Sampling Methodology (ESM) literature in relation to associations between momentary psychosocial predictors and positive psychotic symptoms. As previously stated, the research has consistently indicated that psychosis exists on a continuum with normal experiences,⁵ and ESM has been employed to investigate putative momentary psychosocial mechanisms underlying psychosis-related experiences, predominantly focusing on positive psychotic symptoms¹⁴¹. At the time of selecting the topic for review, there were no reviews conducted of this literature which were systematic in nature or which had taken a structured approach to reviewing the literature (e.g. Myin-Germeys and colleagues¹⁸) and therefore it was felt by the research team that a systematic review focused on exploring associations between psychosocial predictors and psychotic symptoms would be a useful addition to the emerging ESM evidence base. Whilst it may have been more useful to focus on a specific psychotic symptom, as researchers have advocated for putative mechanisms to be investigated in relation to specific symptoms to permit more acuity in hypothesis testing,⁶ initial scoping revealed that, due to ESM research being in its inception, there was insufficient articles investigating the same specific symptom of psychosis (e.g. paranoia, hallucinations) and which also had adequate overlap in the psychosocial processes studied. Therefore, it was deemed favourable to review ESM literature exploring psychosocial predictors for all positive psychotic symptoms studied to date.

The search process was thorough, producing 1683 papers after duplicates were removed. The search was theoretically driven and efficacious with search terms focused around two general strings: experience sampling and psychosis. Although, search terms were not universally inclusive, specific search terms for the numeral types of delusions (e.g. ‘paranoi*’; ‘grandi*’) and for auditory hallucinations (e.g. “hearing voices”) were included. Broader terms such as “Serious Mental” and “Severe Psychiatric” were also included in the search string to maintain the inclusivity of the search and limit the chance

of removing relevant papers. The review focused solely on published papers, rather than unpublished manuscripts or works in progress. The research team reflected on the disadvantages of setting this limit, primarily because relevant data may be excluded and it increases the likelihood of the ‘file drawer’ problem¹⁴²; resultantly biasing the results of the review to those papers reporting significant findings. However, setting this limit guarantees that included papers have undergone robust quality assessment through a rigorous peer review process,¹⁴³ and therefore, as well as for pragmatic reasons, it was felt appropriate to omit the grey literature.

Risk of bias assessment

Determining the quality of reviewed studies and whether any biases are introduced as a result of the specific methodology employed through the use of structured assessment tools is essential to ensuring systematic rigour¹⁴⁴. Instruments utilised to appraise the quality of eligible studies have traditionally adopted a ‘composite approach’. However, such an approach has received growing criticism^{145,146} as disparate methodological limitations which undermine study quality to varying degrees are, in practice, often overlooked with studies instead being discussed in terms of their overall strength by allocation of a numerical quality score. The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines^{22,145} have therefore recommended a component approach to assessing study quality instead be employed.

In accordance with these recommendations, the Agency for Healthcare Research and Quality risk of bias tool²⁵ (see Appendix B) was utilised. The tool assesses risk of bias across multiple methodological domains including the representativeness and description of the cohort; validity of methods used to ascertain participant clinical status, and measure predictors and outcomes; and the appropriateness of the analyses conducted, including consideration of confounding variables. The methodological criteria assessed by this tool was deemed to both fit well with the review methodology and topic under investigation, as well as adhere to PRISMA guidelines^{22,145} as recurrent issues which could introduce bias are discussed across studies allowing one to determine common methodological limitations to the type of methodology employed but also permitting comparison of differences between studies.

An additional advantage of the tool is that it can be specifically adapted for the context of the review. Thereby adhering to additional recommendations from PRISMA^{22,145} which stipulates that risk of bias should be investigated on a case-by-case

bias to ensure only specific methodological factors relevant to the topic or methodology of interest are assessed in detail and contribute to the appraisal of the available evidence. Time was therefore spent reading literature to understand methodological aspects pivotal to conducting high quality ESM research and understanding bias that can be introduced should these aspects not be adhered to. The following additional domains were subsequently added: whether the study utilised equipment which provided a time-stamped response; whether prompts were sent at pseudo-random timepoints; the amount of missing momentary data and how this missing data was classified (i.e. missing data mechanisms); and the conditions under which participants' momentary data was included in the final analysis. Additionally, the criteria for determining the validity of methods for assessing predictor or outcome variables was adapted so that a 'partial' rating could be given if the momentary items employed had not been previously validated in ESM research but had undergone psychometric evaluation which had provided support for their validity and reliability in the current study. This was felt an important distinction to add due to ESM research being in its inception, and many researchers having to develop items to assess constructs of interest on a moment-by-moment basis. The criteria were amended through regular meetings until the final set of criteria was agreed upon. A high degree of reliability was obtained (91%, resolving to 100% after discussion) and it was felt that this was reflective of the time invested in developing a tool that was, clear and reliable in assessing risk of bias for studies using the experience sampling method.

Synthesising data

Reviewed studies had substantial heterogeneity in terms of the psychosocial predictors explored, and the momentary items employed to measure both predictors and positive psychotic symptoms. Therefore, a meta-analysis was not deemed to be plausible¹⁴⁷ and instead a narrative synthesis of the literature was undertaken. Due to the afore mentioned discrepancies across studies, a key issue was to synthesise a vast and heterogenic body of research and present the findings in a coherent and concise way. It was agreeable that presenting the results according to the type of psychosocial predictors under study (i.e. negative affect, cognition), rather than by outcome would be the most meaningful way to coherently present the findings. This decision was made as this permitted the researcher to critically appraise the literature by predictor type and identify where associations were significant across positive psychotic symptoms but also where there was diverging findings for specific types of symptom. Furthermore, numerous studies examined more

than one positive psychotic symptom and thus combining by predictor allowed more detail to be provided regarding the measures utilised, and specific temporal analyses undertaken. The focus of the empirical paper in exploring associations between stress, proximity seeking, and paranoia, aided understanding and interpretation of the multilevel modelling techniques employed by studies in the review which was of great benefit. However, it should be noted that due to large discrepancies in momentary measures utilised it was therefore difficult to compare effect sizes across studies or determine whether the scales utilised had appropriate sensitivity to detect momentary changes in the constructs of interest. It is also noteworthy that while the review presented an evaluation of associations between putative psychosocial predictors and positive psychotic symptoms, an issue remains regarding how to evaluate each mechanism objectively,¹⁴⁸ as it is unclear at present regarding the extent to which the psychosocial processes investigated are independent from each other. By evaluating the quality of the research evidence, the review went some way to address this issue; however, a meta-analysis of studies which have examined psychosocial predictors of positive psychotic symptomatology would enable further scrutiny of the evidence available.

Empirical Paper (Paper 2)

Development of momentary measures of proximity seeking

The researcher developed momentary items of proximity seeking for the purpose of this study. A previous study⁶⁹ explored attachment insecurity as a possible predictor of momentary paranoid thinking, but authors only utilised emotional items of state attachment and therefore, the behavioural strategies individuals with different attachment styles engage in to regulate affect were not measured, meaning it was not possible to use these previously validated measures. We hypothesised that changes in proximity seeking would serve as a behavioural indicator of the attachment system, coming “online” in response to stress⁹⁵, and that, in line with attachment theory, high attachment-anxiety would be associated with an overactivation of proximity seeking. Conversely, we hypothesised that high attachment-avoidance would result in individuals withdrawing; therefore, we would observe a reduction in proximity seeking, at times of elevated stress. Finally, it was hypothesised that too much or too little proximity seeking behaviour would lead to greater reports of paranoid thinking by the mechanisms already described in the empirical paper. The research decided it was therefore necessary to capture changes in the frequency of participants’ proximity seeking, by asking participants to rate the number of times they

had attempted to contact their attachment figure between successive beeps. Research suggests that the majority of individuals aged 18-29 now have a smartphone¹⁴⁹ and that electronic communication is frequent within relationships and is related to positive relationship qualities¹⁵⁰. Furthermore, one study¹⁵¹ found that different attachment styles were related to different modalities of communication as attachment-avoidance was related to less frequent phone use and texting, and greater email usage in comparison to attachment-anxiety¹⁵¹. Therefore, it felt pertinent to capture the numerous modalities of communication that individuals with different attachment styles may use to proximity seek to their attachment figure. Participants were therefore required to rate the number of times since the last beep that they had attempted to contact their attachment figure across five modes of communication: face-to-face contact, telephone call, text messaging, email messaging and social networking sites. Items were revised to facilitate sensitivity to momentary changes and ensure clear and concise wording of phrases¹⁰. Items were then piloted informally by three university students using the online survey platform to assess acceptability of wording, intelligibility and to ensure the format of items translated well to this mode of presentation. Items were further refined based on feedback.

Trait attachment measure

One of the challenges of the empirical study was identifying an appropriate measure of an insecure adult attachment; specifically, attachment anxiety and attachment avoidance. The empirical study aimed to test whether different patterns of proximity seeking behaviour would be observed, in the context of daily life, in individuals with an anxious attachment style (hypothesised overactivation of proximity seeking) compared to those with an avoidant attachment style (hypothesised deactivation or reduction in proximity seeking^{100,101}). Furthermore, research has evidenced that attachment styles are best conceptualised as a two-dimensional space of attachment anxiety and attachment avoidance,^{152,153} which aligns with Bowlby's⁹⁵ theory of affect regulation.

The ECR-S¹¹¹ was therefore chosen as a short form of the Experiences in Close Relationship Scale¹⁵³ which was designed to measure these two conceptualised dimensions of attachment-anxiety (i.e. the extent to which people are insecure vs secure about the availability of romantic partners) and attachment avoidance (i.e. the extent to which people are uncomfortable being close to others vs secure depending on others).¹⁵³ As mentioned in the limitations section of the empirical paper, self-report measures such as the ECR-S,¹¹¹ have been found not to correlate well with more process-focused tools such as the Adult Attachment Interview,¹³⁶ which has led to scepticism about whether

individuals can accurately reflect on their own attachment style and associated responses. The Adult Attachment Interview¹³⁶ uses a semi-structured interview to measure attachment, which is then transcribed and rated in terms of attachment categories, and requires extensive training to obtain reliability in the measure. Therefore, the tool was not selected for use in the empirical study due to the time-consuming nature and potential burden to participants given the considerable number of questionnaires already being administered. Additionally, it was unclear whether the ECR-S provided a valid measure of trait attachment for non-romantic relationships, which may have therefore resulted in trait attachment styles not mapping onto momentary proximity seeking behaviours. However, this warrants further investigation with a larger sample, as this study may have been underpowered to detect a moderating effect of trait attachment on the path from stress to proximity seeking.

Experience Sampling Methodology

The researcher, who was unfamiliar with the experience sampling method when first beginning to undertake and plan this research, immersed herself in articles¹⁰ written to guide researchers wishing to employ this methodology. Resultantly, this enabled her to follow recommendations which should be adhered to for the attainment of high-quality experience sampling methodology research. The researcher spent time talking to participants about why the research was being conducted and its importance in supporting the development of theoretical knowledge in relation to attachment and proximity seeking behaviour, to better understand how these constructs are associated with paranoid thinking in everyday life. It was hoped this would foster participants' altruistic motivation to adhere strictly to a burdensome ESM methodology¹⁰. Time was taken (approximately 40 minutes to one hour) to brief participants about the experience sampling methodology. This involved familiarising participants to the ESM question-and-answer format and providing them with the opportunity to practice completing the ESM diary through the online survey platform and ask any questions. The researcher provided participants with instructions and contact details for use in case of difficulty.¹⁰ This initial meeting took place the day participants started the ESM phase to maximise adherence to the protocol.¹⁰ On the first day of the experience sampling phase, each participant was contacted to confirm the functionality of the text prompts and online survey platform, and ensure all entries were being completed correctly. Participants were also contacted on the seventh day of the ESM phase to review any difficulties and foster motivation¹⁰. Due to its burdensome procedure,

ESM is associated with problems with participant attrition and high-levels of missing data,¹⁰ but in the empirical study only two participants (3.2%) failed to complete the full 14-day assessment period, and participants completed an average of 67.9% prompts, which is felt to reflect the extra time and care the research took to adhere to the recommendations and guidelines proposed by Palmier-Claus and colleagues¹⁰.

Analysis of Experience Sampling Methodology Data

Multi-level modelling is required for analysis of ESM data due to the nested structure of the data³¹. Whilst the study employed appropriate multi-level regression techniques, it is important to reflect on this process in relation to the model hypotheses that were generated from. The model proposed, on the basis of attachment theory⁹⁵ and previous literature,¹⁰⁰ that stress would lead to a change in proximity seeking, and this change would be moderated by trait attachment style; that is, higher attachment-anxiety or higher attachment-avoidance would be associated with a greater magnitude of change in proximity seeking in response to stress¹⁰¹. This change in proximity seeking would then lead to greater reports of paranoid thinking, as changes in proximity seeking provide a behavioural indicator of the attachment system coming “online,” or in other words the activation of attachment-related cognitions to the self and others, and the effects of changes in proximity seeking on momentary paranoia would be greater for individuals higher in attachment insecurity.^{101,134} Whilst the study recruited to target and 60 participants is considered a relatively large sample for ESM, it was not possible to test this theory as a unified whole, as this would require larger samples and more complex modelling techniques to allow for robust testing of different pathways from stress and changes in proximity seeking to paranoia. Therefore, the model was analysed in two halves: stress predicting levels or changes in proximity seeking, moderated by trait attachment; and in separate models changes in proximity seeking predicting momentary paranoia, moderated by trait attachment. As reflected on in the discussion of the empirical paper, a limitation of the present research is its correlational nature; thus, we cannot determine whether causal relationships exist between variables studied. Further exploration is warranted regarding the pathways between stress and changes in proximity seeking, in relation to trait attachment, to disentangle the contribution of these different processes to momentary experiences of paranoia, and whether certain experiences are particularly likely to trigger certain processes.

Additionally, there was discussion in the research team as to whether to adjust for trait or state measures of anxiety, depression and social comparison. As momentary changes in proximity seeking, would serve as a behavioural indicator of the attachment system coming “online” to regulate negative affect in response to stress; it was agreed that adjusting for state mood and social comparison may remove some of the mechanism in this dynamic affect regulation system. The decision was therefore made to adjust for trait measures of anxiety, depression and social comparison in the analyses to determine whether any of the associations substantively reduced.

Dissemination and participant engagement

There is an ethical responsibility to disseminate research findings to study participants, given the interest shown and the time and effort invested in participation¹⁵⁴. As a token of appreciation for their participation, participants were offered university credits or received £10 after completing the follow-up questionnaire measures. Participants in the current study were informed that their contribution to the research would support the development of understanding, theoretical knowledge and possibly future treatment opportunities. Findings will be disseminated to participants who took part in the research and requested feedback of the findings via in a newsletter, and participants will be given the opportunity to ask questions if they so wish. Findings will be presented at psychology and inter-disciplinary research seminars. Wider dissemination of the study findings will be achieved by submitting both the systematic review and the empirical paper for publication in peer-reviewed journals, name *Acta Psychiatrica Scandinavica*.

Personal reflections

My previous experience working as a research assistant in clinical research provided a foundation of skills to drawn upon during the course of this thesis. The research topic chosen was one of interest rather than expertise but provided an exciting, yet somewhat daunting opportunity to acquire knowledge about a new research methodology, specifically the experience sampling method, and develop skills in multilevel modelling techniques which was something I had not previously undertaken. As a result, a significant amount of time and effort was invested in developing an understanding of the research area and the methods employed thorough immersion in the research literature. Producing a thesis alongside complex clinical work has confirmed my values that research, and clinical interventions should always go hand-in-hand. Furthermore, this process allowed me to

reflect on the importance of ensuring that research findings are considered with regard to their utility for us as scientist practitioners when undertaking assessment, formulation and evidence-based practice, as well as considering how the research findings could in the future, impact individuals using mental health services on a day-to-day basis through changes in service structure and policy.

References

1. DeRosse P, Karlsgodt KH. Examining the psychosis continuum. *Curr Behav Neurosci reports*. 2015;2(2):80-89.
2. Van Os J, Linscott RJ, Myin-Germeys I, Delespaul P, Krabbendam L. A systematic review and meta-analysis of the psychosis continuum: evidence for a psychosis proneness–persistence–impairment model of psychotic disorder. *Psychol Med*. 2009;39(2):179-195.
3. Poulton R, Caspi A, Moffitt TE, Cannon M, Murray R, Harrington H. Children’s self-reported psychotic symptoms and adult schizophreniform disorder: a 15-year longitudinal study. *Arch Gen Psychiatry*. 2000;57(11):1053-1058.
4. Tien AY. Distribution of hallucinations in the population. *Soc Psychiatry Psychiatr Epidemiol*. 1991;26(6):287-292.
5. Verdoux H, van Os J. Psychotic symptoms in non-clinical populations and the continuum of psychosis. *Schizophr Res*. 2002;54(1-2):59-65.
6. Bentall RP, Fernyhough C. Social predictors of psychotic experiences: specificity and psychological mechanisms. *Schizophr Bull*. 2008;34(6):1012-1020.
7. Freeman D, Garety P. Helping patients with paranoid and suspicious thoughts: a cognitive–behavioural approach. *Adv Psychiatr Treat*. 2006;12(6):404-415.
8. Trower P, Birchwood M, Meaden A, Byrne S, Nelson A, Ross K. Cognitive therapy for command hallucinations: randomised controlled trial. *Br J Psychiatry*. 2004;184(4):312-320.
9. I. M-G, M. O, D. C, J. L, P. D. Experience sampling research in psychopathology: Opening the black box of daily life. *Psychol Med*. 2009;39(9):1533-1547. doi:<http://dx.doi.org/10.1017/S0033291708004947>
10. J.E. P-C, I. M-G, E. B, et al. Experience sampling research in individuals with mental illness: Reflections and guidance. *ACTA Psychiatr Scand*. 2011;123(1):12-20. doi:<http://dx.doi.org/10.1111/j.1600-0447.2010.01596.x>
11. Morrison AP. The interpretation of intrusions in psychosis: an integrative cognitive approach to hallucinations and delusions. *Behav Cogn Psychother*. 2001;29(3):257-276.

12. Garety PA, Kuipers E, Fowler D, Freeman D, Bebbington PE. A cognitive model of the positive symptoms of psychosis. *Psychol Med.* 2001;31(2):189-195.
13. Freeman D, Garety PA, Kuipers E, Fowler D, Bebbington PE. A cognitive model of persecutory delusions. *Br J Clin Psychol.* 2002;41(4):331-347.
14. Steel C, Fowler D, Holmes EA. Trauma-related intrusions and psychosis: an information processing account. *Behav Cogn Psychother.* 2005;33(2):139-152.
15. Bentall RP, Corcoran R, Howard R, Blackwood N, Kinderman P. Persecutory delusions: a review and theoretical integration. *Clin Psychol Rev.* 2001;21(8):1143-1192.
16. Lobban F, Barrowclough C. An Interpersonal CBT Framework for Involving Relatives in Interventions for Psychosis: Evidence Base and Clinical Implications. *Cognit Ther Res.* 2016;40:198-215. doi:10.1007/s10608-015-9731-3
17. M. C. Validity and reliability of the experience-sampling method. *J Nerv Ment Dis.* 1987;175(9):526-536.
<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed3&NEWS=N&AN=17144371>.
18. Myin-Germeys I, Delespaul P, van Os J, I. M-G, P. D. The Experience Sampling Method in psychosis research. *Curr Opin Psychiatry.* 2003;16(SUPPL. 2):S33-S38. doi:10.1097/00001504-200304002-00006
19. M. O, T. K, P. D. Momentary Assessment Research in Psychosis. *Psychol Assess.* 2009;21(4):498-505. doi:<http://dx.doi.org/10.1037/a0017077>
20. D. K, I. M-G, J. P-C. Mobile assessment guide for research in schizophrenia and severe mental disorders. *Schizophr Bull.* 2012;38(3):386-395. doi:<http://dx.doi.org/10.1093/schbul/sbr186>
21. Scollon CN, Prieto C-K, Diener E. Experience sampling: promises and pitfalls, strength and weaknesses. In: *Assessing Well-Being.* Springer; 2009:157-180.
22. Moher D, Liberati A, Tetzlaff J, Altman DG. Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *Ann Intern Med.* 2009;151(4):264-269.
23. Harvey AG, Watkins E. *Cognitive Behavioural Processes across Psychological Disorders: A Transdiagnostic Approach to Research and Treatment.* Oxford

University Press, USA; 2004.

24. Landis JR, Koch GG. An application of hierarchical kappa-type statistics in the assessment of majority agreement among multiple observers. *Biometrics*. 1977;363-374.
25. Plassman BL, Williams JW, Burke JR, Holsinger T, Benjamin S. Systematic review: factors associated with risk for and possible prevention of cognitive decline in later life. *Ann Intern Med*. 2010;153(3):182-193.
26. Dudley R, Taylor P, Wickham S, Hutton P. Psychosis, delusions and the “jumping to conclusions” reasoning bias: a systematic review and meta-analysis. *Schizophr Bull*. 2015;42(3):652-665.
27. Taylor PJ, Hutton P, Wood L. Are people at risk of psychosis also at risk of suicide and self-harm? A systematic review and meta-analysis. *Psychol Med*. 2015;45(5):911-926.
28. Collip D, Wigman JTW, Myin-Germeys I, et al. From Epidemiology to Daily Life: Linking Daily Life Stress Reactivity to Persistence of Psychotic Experiences in a Longitudinal General Population Study. *PLoS One*. 2013;8(4). doi:10.1371/journal.pone.0062688
29. Kramer I, Simons CJP, Wigman JTW, et al. Time-Lagged Moment-to-Moment Interplay Between Negative Affect and Paranoia: New Insights in the Affective Pathway to Psychosis. *Schizophr Bull*. 2014;40(2):278-286. doi:10.1093/schbul/sbs194
30. Little RJA. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc*. 1988;83(404):1198-1202.
31. Carter L-A, Emsley R. The analysis of experience sampling data. *Exp Sampl Ment Heal Res*. 2019.
32. D. B-Z, K. E, J. S. Examining a cognitive model of persecutory ideation in the daily life of people with schizophrenia: A computerized experience sampling study. *Schizophr Bull*. 2011;37(6):1248-1256. doi:http://dx.doi.org/10.1093/schbul/sbq041
33. Nittel CM suppression is associated with state paranoia in psychosis: A experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia, Lincoln TM, Lamster F, et al. Expressive

- suppression is associated with state paranoia in psychosis: An experience sampling study on the association between adaptive and maladaptive emotion regulation strategies and paranoia. *Br J Clin Psychol.* 2018;57(3):291-312.
doi:10.1111/bjc.12174
34. Peters E, Lataster T, Greenwood K, et al. Appraisals, psychotic symptoms and affect in daily life. *Psychol Med.* 2012;42(5):1013-1023.
doi:http://dx.doi.org/10.1017/S0033291711001802
 35. V. T, R.P. B, M. O, J. AC, T. van L, J. van O. Emotions, self-esteem, and paranoid episodes: an experience sampling study. *Br J Clin Psychol.* 2011;50(2):178-195.
doi:http://dx.doi.org/10.1348/014466510X508677
 36. Wigman JTW, van Os J, Borsboom D, et al. Exploring the underlying structure of mental disorders: cross-diagnostic differences and similarities from a network perspective using both a top-down and a bottom-up approach. *Psychol Med.* 2015;45(11):2375-2387. doi:http://dx.doi.org/10.1017/S0033291715000331
 37. D. B-Z, R. F, S.B. M. self-stigma. *J Dual Diagn.* 2012;8(4):305-314.
doi:http://dx.doi.org/10.1080/15504263.2012.723311
 38. Ben-Zeev D, Morris S, Swendsen J, Granholm E. Predicting the Occurrence, Conviction, Distress, and Disruption of Different Delusional Experiences in the Daily Life of People with Schizophrenia. *Schizophr Bull.* 2012;38(4):826-837.
doi:10.1093/schbul/sbq167
 39. S.H.-W. S, A.K.C. C, E.R. P, J. S, P.A. G. Moment-to-moment associations between negative affect, aberrant salience, and paranoia. *Cogn Neuropsychiatry.* 2018;23(5):299-306. doi:http://dx.doi.org/10.1080/13546805.2018.1503080
 40. Klippel A. Modelling the Interplay Between Psychological Processes and Adverse, Stressful Contexts and Experiences in Pathways to Psychosis: An Experience Sampling Study (vol 43, pg 302, 2017). *Schizophr Bull.* 2018;44(5):1159-1165.
doi:10.1093/schbul/sby068
 41. Klippel A, Viechtbauer W, Reininghaus U, et al. The Cascade of Stress: A Network Approach to Explore Differential Dynamics in Populations Varying in Risk for Psychosis. *Schizophr Bull.* 2018;44(2):328-337. doi:10.1093/schbul/sbx037
 42. K. K, B. S, Lincoln T. AO - Krkovic KO <http://orcid.org/000-0002-1961-9810>.

- An experience sampling study on the nature of the interaction between traumatic experiences, negative affect in everyday life, and threat beliefs. *Schizophr Res.* 2018;201:381-387. doi:http://dx.doi.org/10.1016/j.schres.2018.05.030
43. K. K, S. K, Lincoln T.M. AO - Krkovic KO <http://orcid.org/000.-0002-1961-9810>. Emotion regulation as a moderator of the interplay between self-reported and physiological stress and paranoia. *Eur Psychiatry.* 2018;49:43-49. doi:http://dx.doi.org/10.1016/j.eurpsy.2017.12.002
 44. Ludtke T, Kriston L, Schroder J, et al. Negative affect and a fluctuating jumping to conclusions bias predict subsequent paranoia in daily life: An online experience sampling study. *J Behav Ther Exp Psychiatry.* 2017;56(SI):106-112. doi:http://dx.doi.org/10.1016/j.jbtep.2016.08.014
 45. Buckley PF, Miller BJ, Lehrer DS, Castle DJ. Psychiatric comorbidities and schizophrenia. *Schizophr Bull.* 2008;35(2):383-402.
 46. van Rossum I, Dominguez M-G, Lieb R, Wittchen H-U, van Os J. Affective dysregulation and reality distortion: a 10-year prospective study of their association and clinical relevance. *Schizophr Bull.* 2009;37(3):561-571.
 47. Varese F, Udachina A, Myin-Germeys I, Oorschot M, Bentall RP. The relationship between dissociation and auditory verbal hallucinations in the flow of daily life of patients with psychosis. *PSYCHOSIS-PSYCHOLOGICAL Soc Integr APPROACHES.* 2011;3(1):14-28. doi:10.1080/17522439.2010.548564
 48. Hartley S, Haddock G, e Sa D, et al. An experience sampling study of worry and rumination in psychosis. *Psychol Med.* 2014;44(8):1605-1614. doi:10.1017/S0033291713002080
 49. Hartley S, Haddock G, e Sa D, Emsley R, Barrowclough C. The influence of thought control on the experience of persecutory delusions and auditory hallucinations in daily life. *Behav Res Ther.* 2015;65:1-4. doi:10.1016/j.brat.2014.12.002
 50. Palmier-Claus JE, Dunn G, Taylor H, et al. Cognitive-self consciousness and metacognitive beliefs: Stress sensitization in individuals at ultra-high risk of developing psychosis. *Br J Clin Psychol.* 2013;52(1):26-41. doi:10.1111/j.2044-8260.2012.02043.x

51. U. R, M.J. K, L. V, et al. Stress sensitivity, aberrant salience, and threat anticipation in early psychosis: An experience sampling study. *Schizophr Bull.* 2016;42(3):712-722. doi:http://dx.doi.org/10.1093/schbul/sbv190
52. A. U, V. T, I. M-G, S. F, A. O. Understanding the relationships between self-esteem, experiential avoidance, and paranoia: Structural equation modelling and experience sampling studies. *J Nerv Ment Dis.* 2009;197(9):661-668. doi:http://dx.doi.org/10.1097/NMD.0b013e3181b3b2ef
53. A. U, F. V, I. M-G. The role of experiential avoidance in paranoid delusions: an experience sampling study. *Br J Clin Psychol.* 2014;53(4):422-432. doi:http://dx.doi.org/10.1111/bjc.12054
54. Hayes SC, Strosahl K, Wilson KG, et al. Measuring experiential avoidance: A preliminary test of a working model. *Psychol Rec.* 2004;54(4):553-578.
55. Kapur S. Psychosis as a state of aberrant salience: a framework linking biology, phenomenology, and pharmacology in schizophrenia. *Am J Psychiatry.* 2003;160(1):13-23.
56. Freeman D, Garety PA. Worry, worry processes and dimensions of delusions: an exploratory investigation of a role for anxiety processes in the maintenance of delusional distress. *Behav Cogn Psychother.* 1999;27(1):47-62.
57. Jones SR, Fernyhough C. Rumination, reflection, intrusive thoughts, and hallucination-proneness: towards a new model. *Behav Res Ther.* 2009;47(1):54-59.
58. I. M-G, Ph. D, Myin-Germeys I, Delespaul P, van Os J. Behavioural sensitization to daily life stress in psychosis. *Psychol Med.* 2005;35(5):733-741. doi:10.1017/S0033291704004179
59. Huq SF, Garety PA, Hemsley DR. Probabilistic judgements in deluded and non-deluded subjects. *Q J Exp Psychol Sect A.* 1988;40(4):801-812.
60. Collip I, Oorschot M, Thewissen V, et al. Social world interactions: how company connects to paranoia. *Psychol Med.* 2011;41(5):911-921. doi:10.1017/S0033291710001558
61. Lardinois M, Lataster T, Mengelers R, et al. Childhood trauma and increased stress sensitivity in psychosis. *ACTA Psychiatr Scand.* 2011;123(1):28-35. doi:http://dx.doi.org/10.1111/j.1600-0447.2010.01594.x

62. Palmier-Claus JE, Dunn G, Lewis SW, J.E. P-C, G. D. Emotional and symptomatic reactivity to stress in individuals at ultra-high risk of developing psychosis. *Psychol Med.* 2012;42(5):1003-1012. doi:<http://dx.doi.org/10.1017/S0033291711001929>
63. Weijers J, Viechtbauer W, Eurelings-Bontekoe E, Selten J-P. Reported Childhood Abuse and Stress Reactivity in Psychosis: A Conceptual Replication and Exploration of Statistical Approaches. *Front PSYCHIATRY.* 2018;9. doi:10.3389/fpsyt.2018.00639
64. Barrantes-Vidal N, Chun CA, Myin-Germeys I, Kwapil TR. Psychometric Schizotypy Predicts Psychotic-Like, Paranoid, and Negative Symptoms in Daily Life. *J Abnorm Psychol.* 2013;122(4):1077-1087. doi:10.1037/a0034793
65. P. C-N, T. S, S. B, M. M, I. M-G, T.R. K. Impact of Adverse Childhood Experiences on Psychotic-Like Symptoms and Stress Reactivity in Daily Life in Nonclinical Young Adults. *PLoS One.* 2016;11(4):e0153557. doi:<http://dx.doi.org/10.1371/journal.pone.0153557>
66. I. M-G, N.A. N, Myin-Germeys I, Nicolson NA, Delespaul P. The context of delusional experiences in the daily life of patients with schizophrenia. *Psychol Med.* 2001;31(3):489-498. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed7&NEWS=N&AN=32294047>.
67. H. V, M. H, M. T, et al. Social environments and daily life occurrence of psychotic symptoms - An experience sampling test in a non-clinical population. *Soc Psychiatry Psychiatr Epidemiol.* 2003;38(11):654-661. doi:10.1007/s00127-003-0702-8
68. Vasconcelos E Sa D, Wearden A, Hartley S, et al. Expressed Emotion and behaviourally controlling interactions in the daily life of dyads experiencing psychosis. *Psychiatry Res.* 2016;245:406-413. doi:<http://dx.doi.org/10.1016/j.psychres.2016.08.060>
69. Sitko K, Varese F, Sellwood W, Hammond A, Bentall R. The dynamics of attachment insecurity and paranoid thoughts: An experience sampling study. *PSYCHIATRY Res.* 2016;246:32-38. doi:10.1016/j.psychres.2016.08.057
70. V. T, R.P. B, T. L, J. van O. Fluctuations in Self-Esteem and Paranoia in the Context of Daily Life. *J Abnorm Psychol.* 2008;117(1):143-153.

doi:<http://dx.doi.org/10.1037/0021-843X.117.1.143>

71. Freeman D, Garety PA. Connecting neurosis and psychosis: the direct influence of emotion on delusions and hallucinations. *Behav Res Ther.* 2003;41(8):923-947.
72. Berry K, Bucci S. What does attachment theory tell us about working with distressing voices? *Psychosis.* 2016;8(1):60-71.
73. N. B, R. E, F. L, <http://orcid.org/0000-0001-6594-4350> BSAO-BN. O <http://orcid.org/000.-0001-7414-1541> AO-BS. O <http://orcid.org/000.-0002-6197-5333> AO-ER. O <http://orcid.org/000.-0002-1218-675X> AO-LF. O. Social media and its relationship with mood, self-esteem and paranoia in psychosis. *Acta Psychiatr Scand.* 2018;138(6):558-570. doi:<http://dx.doi.org/10.1111/acps.12953>
74. I. M-G. Stress-reactivity in psychosis: Evidence for an affective pathway to psychosis. *Clin Psychol Rev.* 2007;27(4):409-424. doi:<http://dx.doi.org/10.1016/j.cpr.2006.09.005>
75. Zubin J, Spring B. Vulnerability: a new view of schizophrenia. *J Abnorm Psychol.* 1977;86(2):103.
76. Faught B, Colby KM, Parkison RC. *The Interaction of Inferences, Affects, and Intentions, in a Model of Paranoia.* STANFORD UNIV CA DEPT OF COMPUTER SCIENCE; 1974.
77. Melo SS, Taylor JL, Bentall RP. Poor me versus bad me paranoia and the instability of persecutory ideation. *Psychol Psychother Theory, Res Pract.* 2006;79(2):271-287.
78. Thewissen V, Myin-Germeys I, Bentall R, de Graaf R, Vollebergh W, van Os J. Instability in self-esteem and paranoia in a general population sample. *Soc Psychiatry Psychiatr Epidemiol.* 2007;42(1):1-5.
79. Hoertel N, Le Strat Y, Lavaud P, Dubertret C, Limosin F. Generalizability of clinical trial results for bipolar disorder to community samples: findings from the National Epidemiologic Survey on Alcohol and Related Conditions. *J Clin Psychiatry.* 2013.
80. Sears DO. College sophomores in the laboratory: Influences of a narrow data base on social psychology's view of human nature. *J Pers Soc Psychol.* 1986;51(3):515.
81. Van Lange PAM, Schippers M, Balliet D. Who volunteers in psychology experiments? An empirical review of prosocial motivation in volunteering. *Pers*

Individ Dif. 2011;51(3):279-284.

82. Bentall RP, de Sousa P, Varese F, et al. From adversity to psychosis: pathways and mechanisms from specific adversities to specific symptoms. *Soc Psychiatry Psychiatr Epidemiol.* 2014;49(7):1011-1022.
83. Barlow DH, Allen LB, Choate ML. Toward a unified treatment for emotional disorders. *Behav Ther.* 2004;35(2):205-230.
84. Meichenbaum DH, Deffenbacher JL. Stress inoculation training. *Couns Psychol.* 1988;16(1):69-90.
85. Wells A, Fisher P, Myers S, Wheatley J, Patel T, Brewin CR. Metacognitive therapy in recurrent and persistent depression: A multiple-baseline study of a new treatment. *Cognit Ther Res.* 2009;33(3):291-300.
86. Wells A. A metacognitive model and therapy for generalized anxiety disorder. *Clin Psychol Psychother An Int J Theory Pract.* 1999;6(2):86-95.
87. Wells A. Detached mindfulness in cognitive therapy: A metacognitive analysis and ten techniques. *J Ration Cogn Ther.* 2005;23(4):337-355.
88. Wells A, Matthews G. Modelling cognition in emotional disorder: The S-REF model. *Behav Res Ther.* 1996;34(11-12):881-888.
89. Myin-Germeys I, Birchwood M, Kwapil T. From Environment to Therapy in Psychosis: A Real-World Momentary Assessment Approach. *Schizophr Bull.* 2011;37(2):244-247. doi:10.1093/schbul/sbq164
90. E. G, D. B-Z, P.C. L, K.R. B. Mobile assessment and treatment for schizophrenia (MATS): A pilot trial of an interactive text-messaging intervention for medication adherence, socialization, and auditory hallucinations. *Schizophr Bull.* 2012;38(3):414-425. doi:http://dx.doi.org/10.1093/schbul/sbr155
91. Fenigstein A, Levine MP. Self-attention, concept activation, and the causal self. *J Exp Soc Psychol.* 1984;20(3):231-245.
92. Moutoussis M, Williams J, Dayan P, Bentall RP. Persecutory delusions and the conditioned avoidance paradigm: towards an integration of the psychology and biology of paranoia. *Cogn Neuropsychiatry.* 2007;12(6):495-510.
93. Freeman D, Garety P. Advances in understanding and treating persecutory

- delusions: a review. *Soc Psychiatry Psychiatr Epidemiol.* 2014;49(8):1179-1189.
94. Van Os J, Verdoux H, Maurice-Tison S, et al. Self-reported psychosis-like symptoms and the continuum of psychosis. *Soc Psychiatry Psychiatr Epidemiol.* 1999;34(9):459-463.
 95. Bowlby J. *Attachment And Loss. Vol. 2: Separation: Anxiety And An: Evt.* 1973.
 96. Berry K, Band R, Corcoran R, Barrowclough C, Wearden A. Attachment styles, earlier interpersonal relationships and schizotypy in a non-clinical sample. *Psychol Psychother Theory, Res Pract.* 2007;80(4):563-576.
 97. Main M, Kaplan N, Cassidy J. Security in infancy, childhood, and adulthood: A move to the level of representation. *Monogr Soc Res child Dev.* 1985.
 98. Ainsworth MDS, Blehar M, Waters E, Wall S. Patterns of attachment: Observations in the Strange Situation and at home. *Hillsdale, NJ Erlbaum.* 1978.
 99. Hazan C, Shaver P. Romantic love conceptualized as an attachment process. *J Pers Soc Psychol.* 1987;52(3):511.
 100. Mikulincer M, Shaver PR, Pereg D. Attachment Theory and Affect Regulation: The Dynamics, Development, and Cognitive Consequences of Attachment-Related Strategies. *Motiv Emot.* 2003;27(2):77-102. doi:10.1023/A:1024515519160
 101. Mikulincer M, Shaver PR, Bar-On N, Ein-Dor T. The pushes and pulls of close relationships: Attachment insecurities and relational ambivalence. *J Pers Soc Psychol.* 2010;98(3):450.
 102. Purnell C. Childhood trauma and adult attachment. *Healthc Couns Psychother J.* 2010;10(2):1-7.
 103. Wickham S, Sitko K, Bentall RP. Insecure attachment is associated with paranoia but not hallucinations in psychotic patients: the mediating role of negative self-esteem. *Psychol Med.* 2015;45(7):1495-1507.
 104. Pickering L, Simpson J, Bentall RP. Insecure attachment predicts proneness to paranoia but not hallucinations. *Pers Individ Dif.* 2008;44(5):1212-1224.
 105. Pierce T, Lydon JE. Global and specific relational models in the experience of social interactions. *J Pers Soc Psychol.* 2001;80(4):613.
 106. Scharfe E, Bartholomew KIM. Reliability and stability of adult attachment patterns.

- Pers Relatsh.* 1994;1(1):23-43.
107. Waters E, Merrick S, Treboux D, Crowell J, Albersheim L. Attachment security in infancy and early adulthood: A twenty-year longitudinal study. *Child Dev.* 2000;71(3):684-689.
 108. Baldwin MW, Fehr B. On the instability of attachment style ratings. *Pers Relatsh.* 1995;2(3):247-261.
 109. Csikszentmihalyi M, Larson R. Validity and reliability of the experience-sampling method. In: *Flow and the Foundations of Positive Psychology*. Springer; 2014:35-54.
 110. Freeman D, Evans N, Lister R, Antley A, Dunn G, Slater M. Height, social comparison, and paranoia: an immersive virtual reality experimental study. *Psychiatry Res.* 2014;218(3):348-352.
 111. Wei M, Russell DW, Mallinckrodt B, Vogel DL. The Experiences in Close Relationship Scale (ECR)-short form: Reliability, validity, and factor structure. *J Pers Assess.* 2007;88(2):187-204.
 112. Trinke SJ, Bartholomew K. Hierarchies of attachment relationships in young adulthood. *J Soc Pers Relat.* 1997;14(5):603-625.
 113. Doherty NA, Feeney JA. The composition of attachment networks throughout the adult years. *Pers Relatsh.* 2004;11(4):469-488.
 114. Fenigstein A, Vanable PA. Paranoia and self-consciousness. *J Pers Soc Psychol.* 1992;62(1):129.
 115. Lovibond PF, Lovibond SH. The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behav Res Ther.* 1995;33(3):335-343.
 116. Allan S, Gilbert P. A social comparison scale: Psychometric properties and relationship to psychopathology. *Pers Individ Dif.* 1995;19(3):293-299.
 117. Snijders TAB, Bosker RJ. An introduction to basic and advanced multilevel modeling. Sage, London WONG, GY, y MASON, WM *Hierarchical Logist Regression Model Multilevel Anal J Am Stat Assoc.* 1999;80(5):13-524.
 118. Snijders T. Longitudinal data. In «Multilevel analysis: An introduction to basic and

- advanced multilevel modeling. Ed Snijders and Bosker. 166-200. 2003.
119. Kreft IGG. Are multilevel techniques necessary? An overview, including simulation studies. *Unpubl manuscript, Calif State Univ Los Angeles*. 1996.
 120. Kwok O-M, Underhill AT, Berry JW, Luo W, Elliott TR, Yoon M. Analyzing longitudinal data with multilevel models: An example with individuals living with lower extremity intra-articular fractures. *Rehabil Psychol*. 2008;53(3):370.
 121. StataCorp LP. STATA 12 [Computer software]. *Coll Station TX StataCorp LP*. 2015.
 122. Hox JJ, Moerbeek M, Van de Schoot R. *Multilevel Analysis: Techniques and Applications*. Routledge; 2017.
 123. Schwartz JE, Stone AA. Strategies for analyzing ecological momentary assessment data. *Heal Psychol*. 1998;17(1):6.
 124. Tabachnick BG, Fidell LS. *Using multivariate statistics* Boston. MA Allyn Bacon. 2007;5:2007.
 125. Höhn P, Menne-Lothmann C, Peeters F, et al. Moment-to-Moment Transfer of Positive Emotions in Daily Life Predicts Future Course of Depression in Both General Population and Patient Samples. *PLoS One*. 2013;8(9).
doi:10.1371/journal.pone.0075655
 126. Watson D, Clark LA. Measurement and Mismeasurement of Mood: Recurrent and Emergent issues. *J Pers Assess*. 1997;68(2):267-296.
doi:10.1207/s15327752jpa6802_4
 127. Schmukle SC, Egloff B, Burns LR. The relationship between positive and negative affect in the Positive and Negative Affect Schedule. *J Res Pers*. 2002;36(5):463-475.
 128. Diener E, Emmons RA. The independence of positive and negative affect. *J Pers Soc Psychol*. 1984;47(5):1105.
 129. Ainsworth MD, Wittig B. Attachment, exploration, and separation: illustrated by the behavior of one-year-olds in a strange situation. *Determ infant Behav*. 1969;4:113-136.
 130. Mikulincer M, Shaver P. Mental representations and attachment security. *Interpers*

Cogn. 2005;233-266.

131. Collins NL, Allard LM. Cognitive representations of attachment: The content and function of working models. *Blackwell Handb Soc Psychol Interpers Process.* 2001;2:60-85.
132. Collins NL, Read SJ. Cognitive representations of attachment: The structure and function of working models. 1994.
133. Mikulincer M, SHAVER PR. An attachment perspective on psychopathology. *World Psychiatry.* 2012;11(1):11-15.
134. Garety P, Waller H, Emsley R, et al. Cognitive mechanisms of change in delusions: an experimental investigation targeting reasoning to effect change in paranoia. *Schizophr Bull.* 2014;41(2):400-410.
135. Plotka R. Adult Attachment Interview (AAI). *Encycl Child Behav Dev.* 2011:52-54.
136. George C, Kaplan N, Main M. Attachment interview for adults. *Unpubl manuscript, Univ California, Berkeley.* 1985.
137. Huddy V. The Assessment and Modeling of Perceptual Control A Transformation in Research Methodology to Address the Replication Crisis Warren Mansell School of Health Sciences, University of Manchester, UK. 2018.
138. Carey TA, Tai SJ, Mansell W, Huddy V, Griffiths R, Marken RS. Improving professional psychological practice through an increased repertoire of research methodologies: Illustrated by the development of MOL. *Prof Psychol Res Pract.* 2017;48(3):175.
139. Palmier-Claus JE, Rogers A, Ainsworth J, et al. Integrating mobile-phone based assessment for psychosis into people's everyday lives and clinical care: a qualitative study. *BMC Psychiatry.* 2013;13(1):34.
140. Bucci S, Barrowclough C, Ainsworth J, et al. Actissist: proof-of-concept trial of a theory-driven digital intervention for psychosis. *Schizophr Bull.* 2018;44(5):1070-1080.
141. Myin-Germeys I, Delespaul PAEG, van Os J, I. M-G, P.A.E.G. D. Experience sampling research in psychosis. A review. Aleman Appelo, Barge-Schaapveld, Barge-Schaapveld, Bebbington, Berenbaum, Brett Jones, Cannon, Clark, Csikszentmihalyi, Debowska, Delespaul, Delespaul, Dijkman-Caes, Fowler, Garety,

- Hammen, Heinrichs, Herbener, Krabbendam, Krmg, Larson, Lukoff, Mohamed, A, ed. *Tijdschr Psychiatr.* 2003;45(3):131-140.
<http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=emed8&NEWS=N&AN=36323604>.
142. Rosenthal R. The file drawer problem and tolerance for null results. *Psychol Bull.* 1979;86(3):638.
 143. Hopewell S, Clarke M, Askie L. Reporting of trials presented in conference abstracts needs to be improved. *J Clin Epidemiol.* 2006;59(7):681-684.
 144. Jadad AR, Moher M, Browman GP, et al. Systematic reviews and meta-analyses on treatment of asthma: critical evaluation. *Bmj.* 2000;320(7234):537-540.
 145. Liberati A, Altman DG, Tetzlaff J, et al. The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate health care interventions: explanation and elaboration. *PLoS Med.* 2009;6(7):e1000100.
 146. Greenland S. Invited commentary: a critical look at some popular meta-analytic methods. *Am J Epidemiol.* 1994;140(3):290-296.
 147. Blundell M. Understanding and synthesizing my numerical data. *Doing a Syst Rev student's Guid Los Angeles Sage.* 2014.
 148. Bentall RP, Varese F. A level playing field?: Are bio-genetic and psychosocial studies evaluated by the same standards? 2012.
 149. Rainie L, Zickuhr K, Purcell K, Madden M, Brenner J. The Rise of E-Reading. *Pew Internet Am Life Proj.* 2012.
 150. Coyne SM, Stockdale L, Busby D, Iverson B, Grant DM. "I luv u:)": A descriptive study of the media use of individuals in romantic relationships. *Fam Relat.* 2011;60(2):150-162.
 151. Morey JN, Gentzler AL, Creasy B, Oberhauser AM, Westerman D. Young adults' use of communication technology within their romantic relationships and associations with attachment style. *Comput Human Behav.* 2013;29(4):1771-1778.
 152. Bartholomew K, Horowitz LM. Attachment styles among young adults: a test of a four-category model. *J Pers Soc Psychol.* 1991;61(2):226.
 153. Brennan KA, Clark CL, Shaver PR. Self-report measurement of adult attachment:

An integrative overview. 1998.

154. Fernandez C V, Kodish E, Weijer C. Informing study participants of research results: an ethical imperative. *IRB Ethics Hum Res.* 2003;25(3):12-19.

Appendix A: Instructions to authors: Acta Psychiatrica Scandinavica

Sections

- [1. Submission](#)
- [2. Aims and Scope](#)
- [3. Manuscript Categories and Requirements](#)
- [4. Preparing a Submission](#)
- [5. Editorial Policies and Ethical Considerations](#)
- [6. Author Licensing](#)
- [7. Publication Process After Acceptance](#)
- [8. Post Publication](#)
- [9. Editorial Office Contact Details](#)

1. SUBMISSION

By submitting a manuscript to or reviewing for this publication, your name, email address, and affiliation, and other contact details the publication might require, will be used for the regular operations of the publication, including, when necessary, sharing with the publisher (Wiley) and partners for production and publication. The publication and the publisher recognize the importance of protecting the personal information collected from users in the operation of these services and have practices in place to ensure that steps are taken to maintain the security, integrity, and privacy of the personal data collected and processed. You can learn more at <https://authorservices.wiley.com/statements/data-protection-policy.html>.

Authors should kindly note that submission implies that the content has not been published or submitted for publication elsewhere except as a brief abstract in the proceedings of a scientific meeting or symposium.

Once the submission materials have been prepared in accordance with the Author Guidelines, manuscripts should be submitted online at <https://mc.manuscriptcentral.com/actapsych>

The submission system will prompt authors to use an ORCID iD (a unique author identifier) to help distinguish their work from that of other researchers. [Click here](#) to find out more.

[Click here](#) for more details on how to use ScholarOne.

For help with submissions, please contact: ActaPsych.office@wiley.com

2. AIMS AND SCOPE

Acta Psychiatrica Scandinavica acts as an international forum for the dissemination of information advancing the science and practice of psychiatry. In particular we focus on communicating frontline research to clinical psychiatrists and psychiatric researchers.

Acta Psychiatrica Scandinavica has traditionally been and remains a journal focusing predominantly on clinical psychiatry, but translational psychiatry is a topic of growing importance to our readers. Therefore, the journal welcomes submission of manuscripts based on both clinical- and more translational (e.g. preclinical and epidemiological) research. When preparing manuscripts based on translational studies for submission to *Acta Psychiatrica Scandinavica*, the authors should place emphasis on the clinical significance of the research question and the findings. Manuscripts based solely on preclinical research (e.g. animal models) are normally not considered for publication in the Journal.

3. MANUSCRIPT CATEGORIES AND REQUIREMENTS

(For general formatting guidelines please see point 4).

i. Original Articles

Acta Psychiatrica Scandinavica welcomes submission of manuscripts based on original research, especially those that bring about new knowledge of the aetiology and/or treatment of mental disorders.

Special requirements for Original Articles:

Significant Outcomes: Provide up to three Significant Outcomes encapsulating the 'take-home messages' of the manuscript. The Significant Outcomes are to be presented succinctly (ideally only 1 sentence and max 2 sentences each), in tabulated form and should derive from the conclusions of the manuscript, without merely restating the conclusion, raising new issues, posing further questions or being dogmatic.

Limitations: Provide up to three noteworthy Limitations. The Limitations should inform the reader about potential weaknesses, for instance in relation to study design, sample size and internal/external validity. The Limitations are to be presented succinctly (ideally only 1 sentence and max 2 sentences each) in tabulated form.

In the manuscript, the *Significant Outcomes* and the *Limitations* must be placed immediately below the Abstract/Keywords.

ii. Systematic Reviews / Meta-analyses

Acta Psychiatrica Scandinavica welcomes submission of systematic reviews and meta-analyses. Such submissions must follow both the general guidelines for manuscripts outlined above as well as the guidelines provided in the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Statement: <http://www.prisma-statement.org/PRISMAStatement/PRISMAStatement.aspx>

Special requirements for Systematic Reviews / Meta-analyses:

Summations: Provide up to three significant Summations encapsulating the 'take-home messages' of the manuscript, The Summations should be presented succinctly (ideally only 1 sentence and max 2 sentences each), in tabulated form and should derive from the conclusions of the manuscript, without merely restating the conclusion, raising new issues, posing further questions or being dogmatic.

Limitations: Provide up to three noteworthy Limitations. The Limitations must reflect any caveats or limitations related to the review process or the meta-analysis. The Limitations are to be presented succinctly (ideally only 1 sentence and max 2 sentences each) in tabulated form.

In the manuscript, the *Summations* and *Limitations* must be placed immediately below the Abstract/Keywords.

iii. From Research to Clinical Practice

Acta Psychiatrica Scandinavica welcomes submissions of manuscripts describing how and when research results can be translated to clinical psychiatric practice. Typically, the authors of such manuscripts will have contributed substantially to the development of the area of clinical research that the manuscript is addressing. For a further description of the intended content of this type of submission, please see "[4. PREPARING A SUBMISSION](#)" below.

Special requirements for From Research to Clinical Practice:

Clinical Recommendations: Provide up to three Clinical Recommendations. The Clinical Recommendations should be presented succinctly (ideally only 1 sentence and max 2 sentences each), in tabulated form and should derive from the conclusions of the manuscript, without merely restating the conclusion, raising new issues, posing further questions or being dogmatic.

Limitations: Provide up to three noteworthy Limitations. The Limitations must reflect any caveats related to the potential implementation of new clinical practices. The Limitations are to be presented succinctly (ideally only 1 sentence and max 2 sentences each) in tabulated form. In the manuscript, the *Clinical Recommendations* and *Limitations* must be placed immediately below the Abstract/Keywords.

iv. Research Letters

Acta Psychiatrica Scandinavica welcomes submissions of Research Letters, which represent an opportunity to publish (preliminary) research findings that are of interest to the field. Research Letters are “unstructured”, i.e. without the subheadings used in the full-length manuscripts. The length of the letters should be approximately 750-1000 words and a maximum of 5 references can be included. The authors may include a small table or figure in the submission. Abstracts are not used for Research Letters.

v. Letters to the Editor

Acta Psychiatrica Scandinavica welcomes submissions of Letters to the Editor that either I) comment on recent publications in the Journal or II) voice original ideas, opinions, optimism or concerns with regard to the field of psychiatry. The length of the letters should be approximately 750-1000 words and a maximum of 5 references can be included. The authors may include a small table or figure in the submission. Abstracts are not used for Letters to the Editor.

4. PREPARING A SUBMISSION

Parts of the Manuscript

The manuscript should be submitted in separate files: main text file; figures; supplementary material (for online publication).

Main Text File (Original Articles, Systematic Reviews and From Research to Clinical Practice articles must follow this format)

The main text file should be presented in the following order:

- i. A short informative title without abbreviations or acronyms
- ii. A short running title of 50 characters or less
- iii. The full names of the authors;
- iv. The author's institutional affiliations (where the work was conducted)
- v. Acknowledgments
- vi. Abstract and keywords
- vii. Significant Outcomes and Limitations (for Original Articles); Summations and Limitations (for Review Articles/Meta-Analyses); Clinical Recommendations and Limitations (for From Research to Clinical Practice articles)
- viii. Data availability statement
- ix. Main text
- x. References
- xi. Tables (each table complete with title and footnotes)
- xii. Figure legends
- xiii. Appendices (if relevant)

Authorship

Please refer to the journal's authorship policy the [Editorial Policies and Ethical Considerations section](#) for details on author listing eligibility.

Acknowledgments

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section. Financial and material support should also be acknowledged.

Conflict of Interest Statement

Authors will be asked to provide a conflict of interest statement during the submission process. For details on what to include in this section, see the section 'Conflict of Interest' in the [Editorial Policies and Ethical Considerations](#) section below. Submitting authors should ensure they liaise with all co-authors to confirm agreement with the final statement.

Abstract

The Abstract should be divided into the following sections: 'Objective', 'Methods', 'Results', and 'Conclusion' (the main part of the Abstract is devoted to Results). The abstract should not exceed 200 words.

Keywords

Please provide 3-5 keywords. Keywords should be taken from those recommended by the US National Library of Medicine's Medical Subject Headings (MeSH) browser list at www.nlm.nih.gov/mesh.

Main Text (Original Articles and Systematic Reviews)

Introduction: One to two pages concluded by the subtitle *Aims of the Study* (3 to 5 lines without literature references and abbreviations).

Material and Methods: The authors may refer to design and methods described in previously published articles, but must include a succinct yet comprehensive description of these aspects in the new submission as well.

Results: Clear and short avoiding double documentation to tables/figures.

Discussion: *Acta Psychiatrica Scandinavica* articles do not have a conclusion section. If the authors find it necessary, they may include a concluding remark of maximum 5 lines as the final part of the Discussion.

Main Text (From Research to Clinical Practice articles)

Introduction: Approximately one page that describes the clinical challenge, which the manuscript focuses on (e.g. treatment-resistant depression) and why it is important to address this challenge.

State-of-the-art: A thorough description (but not a systematic review) of the most recent research development in the field (for instance studies on ketamine for the treatment of treatment-resistant depression).

From research to clinical practice: This section should describe how the research findings described in the "state-of-the-art" section can be translated to current clinical practice.

Limitations: This final section should address whether the current level of evidence is sufficient to allow for a change of clinical practice and - if not – what studies that need to be conducted to allow for this change to take place.

References

All references should be numbered consecutively in order of appearance and should be as complete as possible. In text citations should cite references in consecutive order using Arabic superscript numerals. For more information about AMA reference style please consult the [AMA Manual of Style](#)

Sample references follow:

Journal article

1. King VM, Armstrong DM, Apps R, Trott JR. Numerical aspects of pontine, lateral reticular, and inferior olivary projections to two paravermal cortical zones of the cat cerebellum. *J Comp Neurol* 1998;390:537-551.

Book

2. Voet D, Voet JG. Biochemistry. New York: John Wiley & Sons; 1990. 1223 p.

Internet document

3. American Cancer Society. Cancer Facts & Figures 2003.

<http://www.cancer.org/downloads/STT/CAFF2003PWSecured.pdf> Accessed March 3, 2003

Tables

Tables should be self-contained and complement, not duplicate, information contained in the text. They should be supplied as editable files, not pasted as images. Legends should be concise but comprehensive – the table, legend, and footnotes must be understandable without reference to the text. All abbreviations must be defined in footnotes. Footnote symbols: †, ‡, §, ¶, should be used (in that order) and *, **, *** should be reserved for P-values. Statistical measures such as SD or SEM should be identified in the headings.

Figure Legends

Legends should be concise but comprehensive – the figure and its legend must be understandable without reference to the text. Include definitions of any symbols used and define/explain all abbreviations and units of measurement.

Figures

The total number of figures/tables should not exceed 5. Figures are given priority over tables. Although authors are encouraged to send the highest-quality figures possible, for peer-review purposes, a wide variety of formats, sizes, and resolutions are accepted.

[Click here](#) for the basic figure requirements for figures submitted with manuscripts for initial peer review, as well as the more detailed post-acceptance figure requirements.

Figures submitted in color may be reproduced in colour online free of charge. Please note, however, that it is preferable that line figures (e.g. graphs and charts) are supplied in black and white so that they are legible if printed by a reader in black and white. If an author would prefer to have figures printed in colour in hard copies of the journal, a fee will be charged by the Publisher.

Additional Files

Appendices

Appendices will be published after the references. For submission they should be supplied as separate files but referred to in the text.

Supporting Information

Supporting information is information that is not essential to the article, but provides greater depth and background. It is hosted online and appears without editing or typesetting. It may include tables, figures, videos, datasets, etc.

[Click here](#) for Wiley's FAQs on supporting information.

Note: if data, scripts, or other resources used to generate the analyses presented in the paper are available via a publicly available data repository, authors should include a reference to the location of the material within their paper.

General Style Points

The following points provide general advice on formatting and style.

- **Abbreviations:** In general, terms should not be abbreviated unless they are used repeatedly and the abbreviation is helpful to the reader. Initially, use the word in full, followed by the abbreviation in parentheses. Thereafter use the abbreviation only. For abbreviations and symbols use Units, Symbols and Abbreviations for Authors and Editors in Medicine Related Sciences, Sixth Edition. Edited by D.N. Baron and M McKenzie Clarke. ISBN: 9781853156243, Paperback, April, 2008. Abbreviations are not allowed in titles, headings and "Aims of the Study".

- **Units of measurement:** Measurements should be given in SI or SI-derived units. Visit the [Bureau International des Poids et Mesures \(BIPM\) website](#) for more information about SI units.
- **Trade Names:** Chemical substances should be referred to by the generic name only. Trade names should not be used. Drugs should be referred to by their generic names. If proprietary drugs have been used in the study, refer to these by their generic name, mentioning the proprietary name and the name and location of the manufacturer in parentheses.

Wiley Author Resources

Manuscript Preparation Tips: Wiley has a range of resources for authors preparing manuscripts for submission available [here](#). In particular, authors may benefit from referring to Wiley's best practice tips on [Writing for Search Engine Optimization](#).

Editing, Translation, and Formatting Support: [Wiley Editing Services](#) can greatly improve the chances of a manuscript being accepted. Offering expert help in English language editing, translation, manuscript formatting, and figure preparation, Wiley Editing Services ensures that the manuscript is ready for submission.

5. EDITORIAL POLICIES AND ETHICAL CONSIDERATIONS

Peer Review and Acceptance

The acceptance criteria for all papers are the quality and originality of the research and its significance to journal readership. Manuscripts are single-blind peer reviewed. Papers will only be sent to review if the Editor-in-Chief determines that the paper meets the appropriate quality and relevance requirements.

Wiley's policy on the confidentiality of the review process is [available here](#).

Human Studies and Subjects

For manuscripts reporting medical studies that involve human participants, a statement identifying the ethics committee that approved the study and confirmation that the study conforms to recognized standards is required, for example: [Declaration of Helsinki](#); [US Federal Policy for the Protection of Human Subjects](#); or [European Medicines Agency Guidelines for Good Clinical Practice](#). It should also state clearly in the text that all persons gave their informed consent prior to their inclusion in the study.

Patient anonymity should be preserved. Photographs need to be cropped sufficiently to prevent human subjects being recognized (or an eye bar should be used). Images and information from individual participants will only be published where the authors have obtained the individual's free prior informed consent. Authors do not need to provide a copy of the consent form to the publisher; however, in signing the author license to publish, authors are required to confirm that consent has been obtained. Wiley has a [standard patient consent form](#) available for use.

Animal Studies

A statement indicating that the protocol and procedures employed were ethically reviewed and approved, as well as the name of the body giving approval, must be included in the Methods section of the manuscript. Authors should also state whether experiments were performed in accordance with relevant institutional and national guidelines for the care and use of laboratory animals:

- US authors should cite compliance with the [US National Research Council's Guide for the Care and Use of Laboratory Animals](#), the [US Public Health Service's Policy on Humane Care and Use of Laboratory Animals](#), and [Guide for the Care and Use of Laboratory Animals](#).
- UK authors should conform to UK legislation under the [Animals \(Scientific Procedures\) Act 1986 Amendment Regulations \(SI 2012/3039\)](#).
- European authors outside the UK should conform to [Directive 2010/63/EU](#).

Clinical Trial Registration

The journal requires that clinical trials are prospectively registered in a publicly accessible database and clinical trial registration numbers should be included in all papers that report their results. Authors are asked to include the name of the trial register and the clinical trial registration number at the end of the abstract. If the trial is not registered, or was registered retrospectively, the reasons for this should be explained.

Research Reporting Guidelines

Accurate and complete reporting enables readers to fully appraise research, replicate it, and use it. Authors are expected to adhere to recognised research reporting standards. The EQUATOR Network collects more than 370 reporting guidelines for many study types, including for:

- [Randomised trials](#) : [CONSORT](#)
- [Observational studies](#) : [STROBE](#)
- [Systematic reviews and Meta-Analyses](#) : [PRISMA](#)
- [Case reports](#) : [CARE](#)
- [Qualitative research](#) : [SRQR](#)
- [Diagnostic / prognostic studies](#) : [STARD](#)
- [Quality improvement studies](#) : [SQUIRE](#)
- [Economic evaluations](#) : [CHEERS](#)
- [Animal studies](#) : [ARRIVE](#)
- [Study protocols](#) : [SPIRIT](#)
- [Clinical practice guidelines](#) : [AGREE](#)

We also encourage authors to refer to and follow guidelines from:

- [Future of Research Communications and e-Scholarship \(FORCE11\)](#)
- [National Research Council's Institute for Laboratory Animal Research guidelines](#)
- [The Gold Standard Publication Checklist from Hooijmans and colleagues](#)
- [Minimum Information Guidelines from Diverse Bioscience Communities \(MIBBI\) website](#)
- [FAIRsharing website](#)

Genetic Nomenclature

Sequence variants should be described in the text and tables using both DNA and protein designations whenever appropriate. Sequence variant nomenclature must follow the current HGVS guidelines; see varnomen.hgvs.org, where examples of acceptable nomenclature are provided.

Sequence Data

Nucleotide sequence data can be submitted in electronic form to any of the three major collaborative databases: DDBJ, EMBL, or GenBank. It is only necessary to submit to one database as data are exchanged between DDBJ, EMBL, and GenBank on a daily basis. The suggested wording for referring to accession-number information is: 'These sequence data have been submitted to the DDBJ/EMBL/GenBank databases under accession number U12345'. Addresses are as follows:

- DNA Data Bank of Japan (DDBJ): www.ddbj.nig.ac.jp
- EMBL Nucleotide Archive: ebi.ac.uk/ena
- GenBank: www.ncbi.nlm.nih.gov/genbank

Proteins sequence data should be submitted to either of the following repositories:

- Protein Information Resource (PIR): pir.georgetown.edu
- SWISS-PROT: expasy.ch/sprot/sprot-top

Structural Data

For papers describing structural data, atomic coordinates and the associated experimental data should be deposited in the appropriate databank (see below). **Please note that the data in databanks must be released, at the latest, upon publication of the article.** We trust in

the cooperation of our authors to ensure that atomic coordinates and experimental data are released on time.

- **Organic and organometallic compounds:** Crystallographic data should not be sent as Supporting Information, but should be deposited with the *Cambridge Crystallographic Data Centre* (CCDC) at ccdc.cam.ac.uk/services/structure%5Fdeposit.
- **Inorganic compounds:** *Fachinformationszentrum Karlsruhe* (FIZ; fiz-karlsruhe.de).
- **Proteins and nucleic acids:** *Protein Data Bank* (rcsb.org/pdb).
- **NMR spectroscopy data:** *BioMagResBank* (bmr.b.wisc.edu).

Conflict of Interest

The journal requires that all authors disclose any potential sources of conflict of interest. Any interest or relationship, financial or otherwise that might be perceived as influencing an author's objectivity is considered a potential source of conflict of interest. These must be disclosed when directly relevant or directly related to the work that the authors describe in their manuscript. Potential sources of conflict of interest include, but are not limited to: patent or stock ownership, membership of a company board of directors, membership of an advisory board or committee for a company, and consultancy for or receipt of speaker's fees from a company. The existence of a conflict of interest does not preclude publication. If the authors have no conflict of interest to declare, they must also state this at submission. It is the responsibility of the corresponding author to review this policy with all authors and collectively to disclose with the submission ALL pertinent commercial and other relationships.

Funding

Authors should list all funding sources in the Acknowledgments section. Authors are responsible for the accuracy of their funder designation. If in doubt, please check the Open Funder Registry for the correct nomenclature: <https://www.crossref.org/services/funder-registry/>

Authorship

The journal follows the [ICMJE definition of authorship](#), which indicates that authorship be based on the following 4 criteria:

- Substantial contributions to the conception or design of the work; or the acquisition, analysis, or interpretation of data for the work; AND
- Drafting the work or revising it critically for important intellectual content; AND
- Final approval of the version to be published; AND
- Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition to being accountable for the parts of the work he or she has done, an author should be able to identify which co-authors are responsible for specific other parts of the work. In addition, authors should have confidence in the integrity of the contributions of their co-authors.

All those designated as authors should meet all four criteria for authorship, and all who meet the four criteria should be identified as authors. Those who do not meet all four criteria should be acknowledged. These authorship criteria are intended to reserve the status of authorship for those who deserve credit and can take responsibility for the work. The criteria are not intended for use as a means to disqualify colleagues from authorship who otherwise meet authorship criteria by denying them the opportunity to meet criterion #s 2 or 3. Therefore, all individuals who meet the first criterion should have the opportunity to participate in the review, drafting, and final approval of the manuscript.

Contributions from anyone who does not meet the criteria for authorship should be listed, with permission from the contributor, in an Acknowledgments section (for example, to recognize contributions from people who provided technical help, collation of data, writing assistance, acquisition of funding, or a department chairperson who provided general support). Prior to submitting the article all authors should agree on the order in which their names will be listed in the manuscript.

Additional Authorship Options. Joint first or senior authorship: In the case of joint first authorship, a footnote should be added to the author listing, e.g. 'X and Y should be considered joint first author' or 'X and Y should be considered joint senior author.'

Data Sharing and Data Accessibility

Please review [Wiley's policy](#). This journal expects data sharing.

Acta Psychiatrica Scandinavica recognizes the many benefits of archiving research data. *Acta Psychiatrica Scandinavica* expects you to archive all the data from which your published results are derived in a public repository. The repository that you choose should offer you guaranteed preservation (see the registry of research data repositories at <https://www.re3data.org/>) and should help you make it findable, accessible, interoperable, and re-useable, according to FAIR Data Principles (<https://www.force11.org/group/fairgroup/fairprinciples>).

All accepted manuscripts are required to publish a data availability statement to confirm the presence or absence of shared data. If you have shared data, this statement will describe how the data can be accessed, and include a persistent identifier (e.g., a DOI for the data, or an accession number) from the repository where you shared the data. Authors will be required to confirm adherence to the policy. If you cannot share the data described in your manuscript, for example for legal or ethical reasons, or do not intend to share the data then you must provide the appropriate data availability statement. *Acta Psychiatrica Scandinavica* notes that FAIR data sharing allows for access to shared data under restrictions (e.g., to protect confidential or proprietary information) but notes that the FAIR principles encourage you to share data in ways that are as open as possible (but that can be as closed as necessary).

[Sample statements](#) are available. If published, all statements will be placed in the heading of your manuscript.

Data Protection

By submitting a manuscript to or reviewing for this publication, your name, email address, and affiliation, and other contact details the publication might require, will be used for the regular operations of the publication, including, when necessary, sharing with the publisher (Wiley) and partners for production and publication. The publication and the publisher recognize the importance of protecting the personal information collected from users in the operation of these services, and have practices in place to ensure that steps are taken to maintain the security, integrity, and privacy of the personal data collected and processed. You can learn more at <https://authorservices.wiley.com/statements/data-protection-policy.html>.

Human subject information in databases. [The journal refers to the World Health Medical Association Declaration of Taipei on Ethical Considerations Regarding Health Databases and Biobanks.](#)

ORCID

As part of the journal's commitment to supporting authors at every step of the publishing process, the journal requires the submitting author (only) to provide an ORCID iD when submitting a manuscript. This takes around 2 minutes to complete. [Find more information here.](#)

Publication Ethics

This journal is a member of the [Committee on Publication Ethics \(COPE\)](#). Note this journal uses iThenticate's CrossCheck software to detect instances of overlapping and similar text in submitted manuscripts. Read Wiley's Top 10 Publishing Ethics Tips for Authors [here](#). Wiley's Publication Ethics Guidelines can be found [here](#).

Referrals to the Open Access Journals *Brain and Behavior* and *Clinical Case Reports*

Authors of high quality papers that *Acta* cannot offer to publish, perhaps due to scope or space, may be offered to have their manuscript and peer review reports forwarded for

consideration by the editor of either of Wiley's Open Access Journals [Brain and Behavior](#) or [Clinical Case Reports](#). The review process by the Open Access journals will continue at the point left by Acta Psychiatrica Scandinavica. Articles that are eventually accepted by the *Brain and Behavior* or *Clinical Case Reports*, perhaps after revision, will typically be published within 15 days of acceptance. The Editor of the Open Access Journal will accept submissions that report well-conducted research which reaches the standard acceptable for publication. *Brain and Behavior* and *Clinical Case Reports* are Wiley Open Access journals and article publication fees apply.

6. AUTHOR LICENSING

If your paper is accepted, the author identified as the formal corresponding author will receive an email prompting them to log in to Author Services, where via the Wiley Author Licensing Service (WALS) they will be required to complete a copyright license agreement on behalf of all authors of the paper.

Authors may choose to publish under the terms of the journal's standard copyright agreement, or [OnlineOpen](#) under the terms of a Creative Commons License.

General information regarding licensing and copyright is available [here](#). To review the Creative Commons License options offered under OnlineOpen, please [click here](#). (Note that certain funders mandate that a particular type of CC license has to be used; to check this please click [here](#).)

Self-Archiving definitions and policies. Note that the journal's standard copyright agreement allows for self-archiving of different versions of the article under specific conditions. Please [click here](#) for more detailed information about self-archiving definitions and policies.

Open Access fees: If you choose to publish using OnlineOpen you will be charged a fee. A list of Article Publication Charges for Wiley journals is available [here](#).

Funder Open Access: Please click [here](#) for more information on Wiley's compliance with specific Funder Open Access Policies.

7. PUBLICATION PROCESS AFTER ACCEPTANCE

Accepted Article Received in Production

When an accepted article is received by Wiley's production team, the corresponding author will receive an email asking them to login or register with [Wiley Author Services](#). The author will be asked to sign a publication license at this point.

Proofs

Once the paper is typeset, the author will receive an email notification with the URL to download a PDF typeset page proof, as well as associated forms and full instructions on how to correct and return the file.

Please note that the author is responsible for all statements made in their work, including changes made during the editorial process – authors should check proofs carefully. Note that proofs should be returned within 48 hours from receipt of first proof.

Publication Charges

Colour figures. Color figures may be published online free of charge; however, the journal charges for publishing figures in colour in print. If the author supplies colour figures at Early View publication, they will be invited to complete a colour charge agreement in RightsLink for Author Services. The author will have the option of paying immediately with a credit or debit card, or they can request an invoice. If the author chooses not to purchase color printing, the figures will be converted to black and white for the print issue of the journal.

Early View

The journal offers rapid speed to publication via Wiley's Early View service. [Early View](#) (Online Version of Record) articles are published on Wiley Online Library before inclusion in an issue. Note there may be a delay after corrections are received before the article appears online, as Editors also need to review proofs. Once the article is published on Early View, no further changes to the article are possible. The Early View article is fully citable and carries an online publication date and DOI for citations. Early View articles are indexed by PubMed.

8. POST PUBLICATION

Access and sharing

When the article is published online:

- The author receives an email alert (if requested).
- The link to the published article can be shared through social media.
- The author will have free access to the paper (after accepting the Terms & Conditions of use, they can view the article).
- The corresponding author and co-authors can nominate up to ten colleagues to receive a publication alert and free online access to the article.

Promoting the Article

To find out how to best promote an article, [click here](#).

Measuring the Impact of an Article

Wiley also helps authors measure the impact of their research through specialist partnerships with [Kudos](#) and [Altmetric](#).

9. EDITORIAL OFFICE CONTACT DETAILS

ActaPsych.office@wiley.com

Author Guidelines Updated 18 March 2019

Appendix B: Risk of bias assessment tool

Risk of Bias of observational studies

General instructions: Grade each criterion as “Yes,” “No,” “Partially,” or “Can’t tell.” Factors to consider when making an assessment are listed under each criterion. Note that some criteria will only apply to specific types of study. For example, power calculations are relevant for studies aiming to compare suicide risk between two groups, or studies that look at correlates of study outcomes. Where a criterion only applies to a specific design, it is in italics. The examples given for studies meeting, or not meeting, criterion may not apply in every instance. The review team should carefully consider any adaptations needed to this tool and ensure these are implemented prior to starting the Risk of Bias assessment.

Criteria	Yes - criteria met	No - criteria not met
<p>Unbiased selection of the cohort?</p> <p>To consider: is the sample representative of the population of interest?</p> <p>What is the risk of self-selection bias?</p>	<ul style="list-style-type: none"> • True random sample or method that approximates this (e.g. stratified cluster sampling). • All potentially eligible consecutive referrals at a service or clinic are invited to take part in the study • All patients at a service or students within a University are invited - In this case potential participants still have the option to say no and not participate, and so self-selection bias is introduced, but the means of identifying and approaching potential participants does not impose further risk of self-selection. 	<ul style="list-style-type: none"> • Method of sampling liable to introduce substantive self-selection bias • Snowball sampling • Advertising placed in selected locations (e.g. waiting rooms, around University campus) • Advertising via social media <p>CONSIDER PARTIAL RATING IF:</p> <p>Recruitment methods above are used, where self-selection bias likely, but a wider range of recruitment sites or sources are used (e.g. social media and clinical services and community groups) so that the impact of self-selection might be limited.</p>

<p>Sample size calculated (for controlled studies and where studies test for predictors/correlates of outcome)?</p>	<ul style="list-style-type: none"> • Sample size is justified with power calculation, simulation or other appropriate method • Eventual sample size does not deviate by $\geq 10\%$ from the sample size suggested 	<ul style="list-style-type: none"> • No justification of sample size is given <p>CONSIDER PARTIAL RATING IF:</p> <p>Study refers to relevant literature for justification of the sample size.</p>
<p>Adequate description of the cohort?</p>	<ul style="list-style-type: none"> • Age and gender are reported • Ethnicity reported (may be partial rating if this is missing) • Other information concerning participants' demographic background such as education, employment or socio-economic status is given (may be partial rating if this is missing). 	<ul style="list-style-type: none"> • Sample age and gender not reported
<p>Validated method for ascertaining clinical status or participant group</p> <p>Note: this also includes samples with a common, clinically relevant, status, such as survivors of sexual abuse</p> <p>To consider: What is the risk of individuals being incorrectly identified (false positives and negatives)</p>	<ul style="list-style-type: none"> • Validated instrument used to determine relevant clinical status • Valid method of ascertaining diagnosis or clinical 'caseness' (e.g., clinical interview) 	<ul style="list-style-type: none"> • This will depend on researchers' discretion over what constitutes a valid method of ascertaining this information, but non-valid methods may include: • Self-report (or self-report when not obtained through a validated assessment tool) • Chart diagnoses or reliance on medical notes not otherwise confirmed by researchers
<p>Validated methods for assessing predictor or risk variables</p>	<ul style="list-style-type: none"> • Measures used have been previously validated in other research with evidence of acceptable reliability and validity • ESM items have been used in previous research and the authors comment that 	<ul style="list-style-type: none"> • Tool or measure developed specifically for the study i.e. if new ESM items developed specifically for the study. • No psychometric evaluation undertaken, or very minimal evaluation (e.g. internal consistency only)

	<p>the items correlate with the variables they should correlate with and therefore ESM items can be deemed to be reliable.</p> <p>CONSIDER PARTIAL RATING IF:</p> <p>The measure has previously been validated but in the current study sample has poorer psychometric properties such as an internal reliability below .6</p>	<p>CONSIDER PARTIAL RATING IF:</p> <p>The measure has not previously been validated but in the current study sample good evidence of psychometric properties is shown, such as good reliability or results of factor analysis.</p>
<p>Validated methods for assessing outcome or criterion variable</p>	<ul style="list-style-type: none"> • Measures used that has been previously validated in other research with evidence of acceptable reliability and validity • Other valid process for determining outcome may include clinical diagnosis or coroner reports (e.g. if outcome is suicide) • ESM items have been used in previous research and the authors comment that the items correlate with the variables they should correlate with and therefore ESM items can be deemed to be valid. <p>CONSIDER PARTIAL RATING IF:</p> <p>The measure has previously been validated but in the current study sample has poorer psychometric properties such as an internal</p>	<ul style="list-style-type: none"> • Tool or measure developed specifically for the study i.e. if new ESM items developed specifically for the study. • No psychometric evaluation undertaken, or very minimal evaluation (e.g. internal consistency only) <p>CONSIDER PARTIAL RATING IF:</p> <p>The measure has not previously been validated but in the current study sample good evidence of psychometric properties is shown, such as good reliability or results of factor analysis.</p>

	reliability below .6	
Missing data is minimal	<ul style="list-style-type: none"> • Missing person-level data from any group does not exceed 20% • Missing data is present but suitable steps are taken to minimize bias (e.g. sensitivity analysis or imputation). • For momentary-level data- the amount of missing ESM data across the entire sample does not exceed 10% from the number of time-points suggested in the sample size calculation (i.e. power analysis, simulation, or other appropriate method). • Authors state that data are Missing at Random (MAR) or state that the statistical software used the Maximum Likelihood Estimation (MLE) and provide clear justification as to why missing data points can be considered Missing at Random. • Authors state that data are Not Missing At Random (NMAR) and a clear justification is given as to why this is the case i.e. why data are NMAR. • In longitudinal 	<ul style="list-style-type: none"> • Missing person-level data exceed 20% and is not suitable managed. • Missing momentary-level data across the entire sample exceeds 10%. • Authors do not comment on missing data i.e. authors do not acknowledge the amount of missing data. <p>CONSIDER PARTIAL RATING IF:</p> <ul style="list-style-type: none"> • Authors state that data are assumed Missing at Random (MAR) or in the analysis section state statistical software used the Maximum Likelihood Estimation (MLE) but authors do not justify why Missing at Random assumption was met i.e. do not state why data are known to be or can be assumed to be missing at random. • Authors state that data are Not Missing At Random (NMAR) but do not state why missing data is known to be Not Missing At Random.

	<p>studies consider attrition over time as a form of missing data. Note that the criteria of < 20% missing data may be unrealistic over longer follow-up periods.</p>	
<p>Analysis controls for confounding variables</p>	<ul style="list-style-type: none"> • A set of key confounds should be identified <i>a priori</i> (it is not realistic for study to control for all potential confounders, but aim is to identify probable confounders where there is evidence these could bias findings if not adjusted for) • All key confounds that were identified <i>a priori</i> are accounted for in the analyses. 	<ul style="list-style-type: none"> • None of the pre-established confounders are adjusted for within analyses. <p>CONSIDER PARTIAL RATING IF:</p> <ul style="list-style-type: none"> • At least one of the key confounders is accounted for in the analyses.
<p>Analytic methods appropriate</p>	<ul style="list-style-type: none"> • Analysis was appropriate given the type of data (categorical, continuous, etc.), and type of association being tested. • Analysis takes into account issues such as clustering, rare outcomes, multiple comparisons, etc. 	<ul style="list-style-type: none"> • Analysis was not suitable given the type of data or type of associations being tested
<p>Time-stamped response (i.e. risk of retrospective filling in)</p>	<ul style="list-style-type: none"> • Study used mobile phones or other method/equipment that provides a time-stamp of when participants completed each diary. 	<ul style="list-style-type: none"> • Study uses paper ESM diaries which do not give a time-stamped response.
<p>Prompts instructing participants to complete their ESM diary are sent at pseudo-random time-</p>	<ul style="list-style-type: none"> • Prompts for participants to complete their ESM diary are sent at 	<ul style="list-style-type: none"> • Prompts sent at a fixed time and therefore participants can predict when they will receive a

<p>points throughout the day.</p>	<p>pseudo-random time-points throughout the day.</p>	<p>prompt to complete their diary which may affect their responses</p>
<p>Timepoints are only included within the final analysis if participants completed their ESM diary within 15 minutes of the prompt being sent.</p>	<ul style="list-style-type: none"> Time-points where the ESM diary was completed >15 minutes after the prompt was sent are excluded/dropped from the final analysis (if participants have not completed their diary within the 15-minute requested time-frame this is no longer considered to represent ambulant monitoring of their experiences) 	<ul style="list-style-type: none"> Time-points where the ESM diary was completed >15 minutes after the initial prompt are included in the analysis.
<p>Participants are only included in the final analysis if they have provided valid reports for a third of all time-points.</p>	<ul style="list-style-type: none"> Participants must have provided valid reports for a third (33%) of all time-points to be included in the final analysis. 	<ul style="list-style-type: none"> Participants provided data for less than a third (<33%) of time-points and are included in the final analysis. <p>RATE CANNOT TELL IF:</p> <ul style="list-style-type: none"> Number of valid reports per participant is not commented on nor is the criteria under which participants were excluded from the final analysis.

Appendix C: Table 4: Momentary Items of Positive Psychotic Symptoms

Author, Year & Country	Momentary outcome(s)	ESM items to measure outcome(s)
Barrantes-Vidal et al. (2013) Spain	Psychosis-like experiences Paranoia	‘Right now, I fear losing control’ ‘Right now, I feel weird’ ‘Right now, I have difficulty controlling my thoughts’ ‘Right now, familiar things seem strange and unusual’ ‘Right now, I feel mistreated’ ‘Right now, I feel suspicious’
Ben-Zeev et al. (2011) USA	Persecutory ideation	‘Since the last questionnaire, have you had the impression that someone was spying on you or plotting against you’
Ben-Zeev et al. (2012a) USA	Psychotic symptoms	‘Since the last questionnaire, how strongly did you believe someone was spying or plotting against you?’ ‘Since the last questionnaire, how strongly did you believe you could read other people’s thoughts, or they could read yours?’ ‘Since the last questionnaire, how strongly did you believe others could communicate with you through the TV or radio?’ ‘Since the last questionnaire, how strongly did you believe you had special powers and could do things

		nobody else could do?’
		‘Since the last questionnaire, to what extent did you hear voices that others could not hear?’
Ben-Zeev et al.(2012b) USA	Delusions (regardless of type) Delusions of control Delusions of reference Delusions of grandiosity	Delusion occurred (1=Yes, 0=No) ‘Since the last questionnaire have you felt that you were possessed or that someone or something was putting thoughts into your mind?’ ‘Since the last questionnaire, have you felt that someone could communicate with you through the television or radio?’ ‘Since the last questionnaire, have you felt you had special powers to do something nobody else can do?’
Berry et al. (2018). UK	Paranoia	‘I feel that others dislike me’ ‘I feel that others might hurt me’ ‘I feel suspicious’ ‘I feel safe’
Collip et al (2011) ^b Netherlands	Paranoia	‘I feel that others dislike me’ ‘I feel that others might hurt me’ ‘I feel suspicious’ ‘I feel safe’
Collip et al (2013)	Paranoia	‘I feel suspicious’

Netherlands		
Cristóbal-Narváez et al. (2015) ^a Spain	Paranoia Psychotic-like symptoms	<p>‘Feeling suspicious’</p> <p>‘Feeling mistreated’</p> <p>‘Unusual senses’</p> <p>‘Unusual thoughts’</p> <p>‘Feeling weird’</p> <p>‘Losing control’</p> <p>‘Difficulty controlling thoughts’</p> <p>‘Familiar things seeming strange’</p> <p>‘Hearing/seeing things others could not’</p> <p>‘Feeling that thoughts/actions are being controlled by someone or something’</p>
Hartley et al. (2014) ^c UK	Auditory hallucinations Persecutory delusions	<p>‘Just before the beep I was hearing voices that other people cannot hear’</p> <p>Just before the beep went off I was feeling that someone may try to cause me harm’</p>
Hartley et al. (2015) ^c UK	Auditory hallucinations Persecutory delusions	<p>‘Just before the beep I was hearing voices that other people cannot hear’</p> <p>Just before the beep went off I was feeling that someone may try to cause me harm’</p>

Ho-Wai So et al. (2018) UK	Paranoia	'How suspicious do you feel right now?'
Klippel et al. (2018a) Netherlands	Psychotic experiences	'I feel paranoid' 'I feel unreal' 'I hear things that aren't really there' 'I see things that aren't really there' 'I can't get these thoughts out of my head' 'My thoughts are influenced by others' 'It's hard to express my thoughts in words' 'I feel like I am losing control'
Klippel et al. (2018b) ^{d *} Netherlands	Psychotic experiences	'I feel suspicious' 'I am afraid to lose control'
Kramer et al. (2014) Belgium	Paranoia	'I feel suspicious'
Krkovic et al. (2018a) ^e Germany	Paranoia	'People are trying to make me upset' 'I need to be on my guard against others' 'Strangers and friends look at me critically'

Krkovic et al. (2018b)^e
Germany

Paranoia

‘I need to be on my guard against others’

‘Strangers and friends look at me critically’

‘People try to upset me’

Lardinois et al. (2011)
Netherlands

Psychosis

‘My thoughts are now paranoid’

‘My thoughts are difficult to express’

‘I can’t get rid of my thoughts’

‘My thoughts are influenced by other people’

‘I’m suspicious’

‘I feel unreal’

‘I see things’

‘I am afraid to do something uncontrolled’

Lüdtke et al. (2017)
Germany

Paranoia

‘Do you think that something strange is going on at the moment?’

‘Do you feel persecuted at the moment?’

Myin-Germeys et al. (2001)^{d g}
Netherlands

Delusions

‘I’m preoccupied by my thoughts’

‘My thoughts are suspicious’

‘My thoughts are being influenced’

‘What am I thinking about at this moment? (Delusional/Not delusional)’

Nittel et al. (2018)
Germany

Paranoia

'I feel that others dislike me'

'I feel that others might hurt me'

'I feel suspicious'

Palmier-Claus et al. (2012)^f
UK

Hallucinations
Delusional/
dissociative thinking

'I am hearing voices'

'I am seeing things that are not real'

'My thoughts are suspicious'

'My thoughts are being influenced'

'I feel threatened'

'I feel unreal'

Palmier-Claus et al. (2013)^f
UK

Hallucinations
Delusional/
dissociative thinking

'I am hearing voices'

'I am seeing things that are not real'

'My thoughts are suspicious'

'My thoughts are being influenced'

'I feel threatened'

'I feel unreal'

Peters et al. (2011)
UK

Auditory Hallucinations
Delusions

'My first problem is...' (hallucinations)

'My first problem is' (delusions)

		'My first/second problem is present'
Reininghaus et al. (2016) UK	Psychotic experiences	'I feel paranoid' 'I feel unreal' 'I hear things that aren't really there' 'I see things that aren't really there' 'I can't get these thoughts out of my head' 'My thoughts are influenced by others' 'It's hard to express my thoughts in words' 'I feel like I am losing control'
Sitko et al. (2016) UK	Paranoia Auditory hallucinations	'I feel paranoid' 'I feel unreal' 'I hear things that aren't really there' 'I see things that aren't really there' 'I can't get these thoughts out of my head' 'My thoughts are influenced by others' 'It's hard to express my thoughts in words' 'I feel like I am losing control'

Thewissen et al.(2008) ^{b d g} Netherlands	Paranoia	<p>‘Right now, I worry that others are plotting against me’</p> <p>‘I believe that some people want to hurt me deliberately’</p>
Thewissen et al. (2011) ^b Netherlands	Paranoia	<p>‘I feel that others dislike me’</p> <p>‘I feel that others might hurt me’</p> <p>‘I feel suspicious’</p> <p>‘I feel safe’</p>
Udachina et al. (2009) UK	Paranoia	<p>‘I feel that others dislike me’</p> <p>‘I feel that others might hurt me’</p> <p>‘I feel suspicious’</p> <p>‘I feel safe’</p>
Udachina et al. (2014) UK	Paranoia	<p>‘I feel that others might hurt me’</p> <p>‘I feel that I can trust no-one’</p> <p>‘I feel that there are people who think of me as a bad person’</p>
Varese et al. (2011) UK	Auditory hallucinations	<p>‘I worry that others are plotting against me’</p> <p>‘I feel that I can trust no one’</p> <p>‘I believe that some people want to hurt me deliberately’</p>

Vasconcelos e Sa et al (2016) UK	Psychosis experiences	'Right now, I hear voices that other people can't hear'
Verdoux et al. (2003) France	Perceived hostility Strange impressions Unusual perceptions Thought influence	Just before the beep went off I was: 'hearing voices'; 'seeing things (that other people cannot see)'; 'feeling that someone may try and cause me harm'; 'suspicious'; 'afraid I could lose control'; 'unable to get rid of my thoughts'; 'feeling unreal'; 'feeling that my thoughts are being influenced or controlled'; 'finding it difficult to express my thoughts'
Weijers et al. (2018) Netherlands	Psychotic experiences	'How would you describe the social ambiance and persons you met?' (perceived hostility) 'Did you have the impression that something strange happened to you or around you that you could not explain?' (Strange impressions) 'Did you have unusual perceptual experiences?' (Unusual perceptions) 'Did you have the impression that your thoughts or emotions could be read or influenced?' (Thought influence)
Wigman et al. (2015) § ** Netherlands	Paranoia	'Feeling unreal' 'Feeling disliked' 'Feeling suspicious' 'Fearing that one might be hurt by others' 'Fearing to lose control'

'Hearing voices'

'Experiencing that one's thoughts are being influenced by others'

'Suspiciousness'

Appendix D: Table 5. Results of multilevel regression analyses

Author (Year)	Sample	Outcome	Predictor (co-variates)	β / OR	P-Value	95% CI
Barrantes-Vidal et al. (2013)	Overall sample	Paranoia	Being alone vs with others t	-0.01	Not reported but not-significant	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Paranoia	Feeling close to others t	-0.03	<.001	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Paranoia	Feeling unwanted t	0.14	<0.01	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Paranoia	Situational stress t	0.08	<.001	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Psychotic experiences	Being alone vs with others t	0.00	Not reported but not-significant	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Psychotic experiences	Feeling close to others t	-0.01	<0.01	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Psychotic experiences	Feeling unwanted t	0.07	<.001	Not reported
Barrantes-Vidal et al. (2013)	Overall sample	Psychotic experiences	Situational stress t	0.03	<.001	Not reported
Ben-Zeev et al. (2011)	Overall sample	Paranoia	Anxiety t-1 (paranoia t-1)	1.32	<0.01	1.12 to 1.54
Ben-Zeev et al. (2011)	Overall sample	Paranoia	Sadness t-1 (paranoia t-1)	1.26	<0.05	1.03 to 1.53

Ben-Zeev et al. (2011)	Overall sample	Paranoia	External event: housing/finance t-1 (paranoia t-1)	1.39	Not reported but not-significant	0.43 to 4.45
Ben-Zeev et al. (2011)	Overall sample	Paranoia	External event: work/education t-1 (paranoia t-1)	1.01	Not reported but not-significant	0.23 to 4.45
Ben-Zeev et al. (2011)	Overall sample	Paranoia	External event: interactions with strangers t-1 (paranoia t-1)	0.96	Not reported but not-significant	0.34 to 2.76
Ben-Zeev et al. (2011)	Overall sample	Paranoia	External event: other t-1 (paranoia t-1)	1.32	Not reported but not-significant	0.65 to 2.67
Ben-Zeev et al. (2012a)	Overall sample	Psychotic symptoms	Negative affect t-1 (negative affect t; self-stigma t-1; self-stigma t; positive affect t-1; positive affect t; psychosis t-1)	-0.01	0.49	Not reported
			Negative affect t (negative affect t-1; self-stigma t-1; self-stigma t; positive affect t-1; positive affect t; psychosis t-1)	0.13	<0.01	Not reported
Ben-Zeev et al. (2012a)	Overall sample	Psychotic symptoms	Positive affect t-1 (positive affect t; self-stigma t-1; self-stigma t; negative affect t-1; negative affect t; psychosis t-1)	0.01	0.47	Not reported
			Positive affect t (positive affect t-1; self-stigma t-1; self-stigma t; negative affect t-1; negative affect t; psychosis t-1)	0.01	0.80	Not reported
Ben-Zeev et al. (2012a)	Overall sample	Psychotic symptoms	Self-stigma t-1 (self-stigma t; negative affect t-1; negative affect t; positive affect t-1; positive affect t; psychosis t-1)	0.01	0.55	Not reported
			Self-stigma t (self-stigma t-1; negative affect t-1; negative affect t; positive affect t-1; positive affect t; psychosis t-1)	0.08	<0.01	Not reported
Ben-Zeev et al. (2012b)	Overall sample	Delusions (control reference or grandiosity)	Sadness t-1	0.95	Not reported but not-significant	0.80 to 1.12
Ben-Zeev et al. (2012b)	Overall sample	Delusions (control reference or grandiosity)	Anxiety t-1	1.09	Not reported but not-significant	0.97 to 1.23
Ben-Zeev et al. (2012b)	Overall sample	Delusions of control	Sadness t-1	1.05	Not reported but not-significant	0.89 to 1.24
Ben-Zeev et al. (2012b)	Overall sample	Delusions of control	Anxiety t-1	1.08	Not reported but not-significant	0.94 to 1.23
Ben-Zeev et al. (2012b)	Overall sample	Delusions of reference	Sadness t-1	0.95	Not reported but not-significant	0.77 to 1.17

Ben-Zeev et al. (2012b)	Overall sample	Delusions of reference	Anxiety t-1	1.03	Not reported but not-significant	0.89 to 1.20
Ben-Zeev et al. (2012b)	Overall sample	Delusions of grandiosity	Sadness t-1	0.87	Not reported but not-significant	0.73 to 1.04
Ben-Zeev et al. (2012b)	Overall sample	Delusions of grandiosity	Anxiety t-1	1.09	Not reported but not-significant	0.93 to 1.28
Berry et al. (2018)	Overall sample	Paranoia	Social media use t-1 (socialisation t-1; group)	0.13	0.478	-0.22 to 0.48
Berry et al. (2018)	Overall sample	Paranoia	Social rank t-1 (socialisation t-1; group)	-0.08	<.001	-0.10 to -0.06
Berry et al. (2018)	Overall sample	Paranoia	Content posting t-1 (socialisation t-1; group)	0.66	<0.05	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Content consumption t-1 (socialisation t-1; group)	-0.53	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Direct communication t-1 (socialisation t-1; group)	0.49	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Posting about daily activities t-1 (socialisation t-1; group)	0.16	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Posting about opinions t-1 (socialisation t-1; group)	-0.10	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Posting about feeling t-1 (socialisation t-1; group)	2.72	<.001	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Posting pictures/videos t-1 (socialisation t-1; group)	0.32	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Venting on social media t-1 (socialisation t-1; group)	2.13	<0.01	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Looking through newsfeeds t-1 (socialisation t-1; group)	-0.88	<0.01	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Viewing 'friends' profiles t-1 (socialisation t-1; group)	-0.10	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Viewing profiles of people who are not 'friends' t-1 (socialisation t-1; group)	1.26	<0.01	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Commenting on another person's post/picture t-1 (socialisation t-1; group)	0.66	<0.05	Not reported

Berry et al. (2018)	Overall sample	Paranoia	Liking another person's post/picture t-1 (socialisation t-1; group)	0.01	Not reported but not-significant	Not reported
Berry et al. (2018)	Overall sample	Paranoia	Sharing another person's post/picture t-1 (socialisation t-1; group)	0.29	Not reported but not-significant	Not reported
Collip et al. (2011).	Overall sample	Paranoia	Being alone vs with others t (age; gender)	0.01	0.068	Not reported
Collip et al. (2011).	Overall sample	Paranoia	Familiar vs less-familiar individuals t (age; gender)	0.07	0.052	Not reported
Collip et al. (2011)	High paranoia group	Paranoia	Familiar vs less-familiar individuals t (age; gender)	-0.07	0.10	-0.16 to 0.02
			Familiar vs less-familiar individuals t (age; gender; social threat t-1; paranoia t-1)	Not reported	Not reported but not-significant	Not reported
Collip et al. (2011)	Medium paranoia group	Paranoia	Familiar vs less-familiar individuals t (age; gender)	0.11	<0.01	0.03 to 0.20
			Familiar vs less-familiar individuals t (age; gender; social threat t-1; paranoia t-1)	Not reported	Not reported but significant	Not reported
Collip et al. (2011)	Low paranoia group	Paranoia	Familiar vs less-familiar individuals t (age; gender)	0.07	<0.05	-0.01 to 0.13
			Familiar vs less-familiar individuals t (age; gender; social threat t-1; paranoia t-1)	Not reported	Not reported but significant	Not reported
Collip et al. (2011)	High paranoia group	Paranoia	Event-related stress t	0.06	<.001	Not reported
			Event-related stress t (paranoia t-1)	Not reported	Not reported but significant	Not reported
Collip et al. (2011)	Medium paranoia group	Paranoia	Event-related stress t	0.04	<.001	Not reported
			Event-related stress t (paranoia t-1)	Not reported	Not reported but significant	Not reported
Collip et al. (2011)	Low paranoia group	Paranoia	Event-related stress t	0.03	<.001	Not reported
			Event-related stress t (paranoia t-1)	Not reported	Not reported but significant	Not reported
Collip et al. (2013)	Persistent subclinical Group	Paranoia	Activity-related stress t	0.07	<.001	0.06 to 0.09
Collip et al. (2013)	Low subclinical Group	Paranoia	Activity-related stress t	0.04	<.001	0.03 to 0.04

Cristóbal-Narváez et al. (2015)	Overall sample	Paranoia	Being alone vs with others t	0.00	Not reported but not-significant	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Paranoia	Feeling unwanted t	0.15	<0.01	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Paranoia	Social stress t	0.06	<.001	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Paranoia	Situational stress t	0.08	<.001	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Psychotic experiences	Being alone vs with others t	0.00	Not reported but not-significant	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Psychotic experiences	Feeling unwanted t	0.08	<.001	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Psychotic experiences	Social stress t	0.02	<.001	Not reported
Cristóbal-Narváez et al. (2015)	Overall sample	Psychotic experiences	Situational stress t	0.04	<.001	Not reported
Hartley et al. (2014)	Overall sample	Paranoia	Proximal worry- period between t-1 and t	0.62	<.001	0.50 to 0.75
			Lagged worry- period between t-2 and t-1	0.33	<.001	0.19 to 0.48
Hartley et al. (2014)	Overall sample	Paranoia	Proximal rumination- period between t-1 and t	0.49	<.001	0.37 to 0.60
			Lagged rumination- period between t-2 and t-1	0.20	0.002	0.07 to 0.33
Hartley et al. (2015)	Overall sample	Paranoia	Proximal thought control- period between t-1 and t	0.33	<.001	0.22 to 0.45
			Lagged thought control- period between t-2 and t-1	0.14	0.028	0.02 to 0.27
Hartley et al. (2014)	Overall sample	Auditory hallucinations	Proximal worry- period between t-1 and t	0.57	<.001	0.43 to 0.71
			Lagged worry- period between t-2 and t-1	0.21	0.016	0.04 to 0.37
Hartley et al. (2014)	Overall sample	Auditory hallucinations	Proximal rumination- period between t-1 and t	0.63	<.001	0.50 to 0.75
			Lagged rumination- period between t-2 and t-1	0.20	<.001	0.05 to 0.35

Hartley et al. (2015)	Overall sample	Auditory hallucinations	Proximal thought control- period between t-1 and t	0.58	<.001	0.46 to 0.70
			Lagged thought control- period between t-2 and t-1	0.08	0.268	0.06 to 0.23
Ho-Wai So et al. (2018)	Overall sample	Paranoia	Negative affect t-1 (age; gender)	0.20	<.001	Not reported
			Negative affect t-1 (age; gender; paranoia t-1)	0.18	<.001	Not reported
Ho-Wai So et al. (2018)	Overall sample	Paranoia	Aberrant Salience t-1 (age; gender)	0.30	<.001	Not reported
			Aberrant Salience t-1 (age; gender; paranoia t-1)	0.28	<.001	Not reported
Klippel et al. (2018a)	FEP	Psychotic experiences	Negative affect t-1 (age; gender; ethnicity; level of education; employment)	0.19	<.001	0.11 to 0.35
Klippel et al. (2018a)	ARMS	Psychotic experiences	Negative affect t-1 (age; gender; ethnicity; level of education; employment)	0.24	<.001	0.06 to 0.13
Klippel et al. (2018a)	Controls	Psychotic experiences	Negative affect t-1 (age; gender; ethnicity; level of education; employment)	0.17	<.001	0.10 to 0.25
Klippel et al. (2018a)	FEP	Psychotic experiences	Threat anticipation t-1 (age; gender; ethnicity; level of education; employment)	0.12	<.001	0.07 to 0.17
Klippel et al. (2018a)	ARMS	Psychotic experiences	Threat anticipation t-1 (age; gender; ethnicity; level of education; employment)	0.10	<.001	0.06 to 0.14
Klippel et al. (2018a)	Controls	Psychotic experiences	Threat anticipation t-1 (age; gender; ethnicity; level of education; employment)	0.17	<.001	0.10 to 0.25
Klippel et al. (2018a)	FEP	Psychotic experiences	Event-related stress t-1 (age; gender; ethnicity; level of education; employment)	0.04	0.04	0.00 to 0.08
Klippel et al. (2018a)	ARMS	Psychotic experiences	Event-related stress t-1 (age; gender; ethnicity; level of education; employment)	0.05	0.01	0.02 to 0.08
Klippel et al. (2018a)	Controls	Psychotic experiences	Event-related stress t-1 (age; gender; ethnicity; level of education; employment)	0.03	0.02	0.03 to 0.05
Klippel et al. (2018a)	FEP	Psychotic experiences	Activity-related stress t-1 (age; gender; ethnicity; level of education; employment)	0.14	<.001	0.10 to 0.18
Klippel et al. (2018a)	ARMS	Psychotic experiences	Activity-related stress t-1 (age; gender; ethnicity; level of education; employment)	0.16	<.001	0.12 to 0.21
Klippel et al. (2018a)	Controls	Psychotic experiences	Activity-related stress t-1 (age; gender; ethnicity; level of education; employment)	0.07	<.0011	0.03 to 0.11
Klippel et al. (2018a)	FEP	Psychotic experiences	Social stress t-1 (age; gender; ethnicity; level of education; employment)	0.04	0.12	-0.01 to 0.08

Klippel et al. (2018a)	ARMS	Psychotic experiences	Social stress t-1 (age; gender; ethnicity; level of education; employment)	0.09	<.001	0.06 to 0.13
Klippel et al. (2018a)	Controls	Psychotic experiences	Social stress t-1 (age; gender; ethnicity; level of education; employment)	0.06	<.0011	0.03 to 0.09
Klippel et al. (2018b)	Psychotic patients	Suspicious	Event-related stress t-1 (age, gender)	0.05	<.001	Not reported
Klippel et al. (2018b)	First-degree relatives	Suspicious	Event-related stress t-1 (age, gender)	0.02	<.001	Not reported
Klippel et al. (2018b)	Controls	Suspicious	Event-related stress t-1 (age, gender)	0.02	0.004	Not reported
Klippel et al. (2018b)	Psychotic patients	Suspicious	Alone t-1 (age, gender)	0.00	0.376	Not reported
Klippel et al. (2018b)	First-degree relatives	Suspicious	Alone t-1 (age, gender)	0.00	0.126	Not reported
Klippel et al. (2018b)	Controls	Suspicious	Alone t-1 (age, gender)	-0.01	0.008	Not reported
Klippel et al. (2018b)	Psychotic patients	Loss of control	Event-related stress t-1 (age, gender)	0.05	<.001	Not reported
Klippel et al. (2018b)	First-degree relatives	Loss of control	Event-related stress t-1 (age, gender)	0.02	<.001	Not reported
Klippel et al. (2018b)	Controls	Loss of control	Event-related stress t-1 (age, gender)	0.02	<.001	Not reported
Klippel et al. (2018b)	Psychotic patients	Loss of control	Relaxed t-1 (age, gender)	-0.03	0.006	Not reported
Klippel et al. (2018b)	First-degree relatives	Loss of control	Relaxed t-1 (age, gender)	0.01	0.076	Not reported
Klippel et al. (2018b)	Controls	Loss of control	Relaxed t-1 (age, gender)	-0.00	0.253	Not reported

Kramer et al. (2014)	Overall sample	Paranoia	Negative affect t	0.23	<.001	Not reported
Kramer et al. (2014)	Overall sample	Paranoia t +1	Negative affect t	0.08	<.001	Not reported
Krkovic et al. (2018a)	Overall sample	Paranoia	Negative affect period between t-1 and t	0.31	<.001	0.23 to 0.40
			Lagged negative affect period between t-2 and t-1	0.12	0.001	0.05 to 0.19
Krkovic et al. (2018b)	Overall sample	Paranoia	Stress t-1 to t (paranoia t-1)	0.24	<.001	0.17 to 0.31
Lardinois et al. (2011)	Overall sample	Psychotic experiences	Event-related stress t	0.07	<.001	Not reported
Lardinois et al. (2011)	Overall sample	Psychotic experiences	Activity-related stress t	0.10	<.001	Not reported
Lüdtke et al. (2017)	Overall sample	Paranoia	Negative affect t-1	0.25	<.001	0.14 to 0.37
Lüdtke et al. (2017)	Overall sample	Paranoia	Jumping to conclusions bias t-1	0.10	0.032	0.01 to 0.19
			Jumping to conclusions bias t-1 (negative affect t-1)	0.11	0.019	0.02 to 0.21
Myin-Germeys et al. (2001)	Overall sample	Delusions	Current activity t-1	Not reported	Not reported but not significant	Not reported
Myin-Germeys et al. (2001)	Overall sample	Delusions	Change in activity: change to doing nothing	1.13	<0.05	Not reported
Myin-Germeys et al. (2001)	Overall sample	Delusions	Change in activity: change to work activity	Not reported	Not reported but not significant	Not reported
Myin-Germeys et al. (2001)	Overall sample	Delusions	Change in activity: change to leisure activity	Not reported	Not reported but not significant	Not reported
Myin-Germeys et al. (2001)	Overall sample	Delusions	Persons currently present t-1: alone vs family/acquaintances	-0.72	<0.05	Not reported
Myin-Germeys et al. (2001)	Overall sample	Delusions	Persons currently present t-1: alone vs strangers	Not reported	Not reported but not significant	Not reported

Myin-Germeys et al. (2001)	Overall sample	Delusions	Change in company	Not reported	Not reported but not significant	Not reported
Nittel et al. (2018)	Overall sample	Paranoia	Emotional instability	0.56	<0.05	Not reported
Nittel et al. (2018)	Overall sample	Paranoia	Negative affect t-1 (paranoia t-1)	0.04	0.179	Not reported
			Negative affect t-1 (paranoia t-1; reappraisal t-1)	0.05	Not reported but not significant	Not reported
			Negative affect t-1 (paranoia t-1; acceptance t-1)	0.04	Not reported but not significant	Not reported
			Negative affect t-1 (paranoia t-1; distraction t-1)	0.04	Not reported but not significant	Not reported
			Negative affect t-1 (paranoia t-1; social sharing t-1)	0.04	Not reported but not significant	Not reported
			Negative affect t-1 (paranoia t-1; reflection t-1)	0.04	Not reported but not significant	Not reported
			Negative affect t-1 (paranoia t-1; rumination t-1)	0.06	<0.05	Not reported
			Negative affect t-1 (paranoia t-1; Expressive suppression t-1)	0.02	Not reported but not significant	Not reported
Nittel et al. (2018)	Overall sample	Paranoia	Emotional instability	0.56	<0.05	Not reported
Palmier-Claus et al. (2012)	Overall sample	Delusions	Activity-related stress t	0.15	<.001	Not reported
Palmier-Claus et al. (2012)	Overall sample	Delusions	Social stress t	0.10	<.001	Not reported
Palmier-Claus et al. (2012)	Overall sample	Delusions	Event-related stress t	0.85	<.001	Not reported
Palmier-Claus et al. (2012)	Overall sample	Hallucinations	Activity-related stress t	1.11	<.001	Not reported
Palmier-Claus et al. (2012)	Overall sample	Hallucinations	Social stress t	1.08	0.146	Not reported
Palmier-Claus et al. (2012)	Overall sample	Hallucinations	Event-related stress t	3.18	<.001	Not reported

Palmier-Claus et al. (2013)	Overall sample	Delusions	Activity-related stress t	0.13	<.001	Not reported
Palmier-Claus et al. (2013)	Overall sample	Delusions	Social stress t	0.11	<.001	Not reported
Palmier-Claus et al. (2013)	Overall sample	Delusions	Event-related stress t	0.07	<.001	Not reported
Palmier-Claus et al. (2013)	Overall sample	Delusions	Momentary cognitive self-consciousness t-1	0.04	0.097	Not reported
Palmier-Claus et al. (2013)	Overall sample	Delusions	Momentary cognitive self-consciousness t	0.18	<.001	Not reported
			Momentary cognitive self-consciousness t (negative affect t-1; negative affect t)	Not reported	<.001	Not reported
			Momentary cognitive self-consciousness t (positive affect t-1; positive affect t)	Not reported	<.001	Not reported
			Momentary cognitive self-consciousness t (hallucinations t-1; hallucinations t)	Not reported	<.001	Not reported
Palmier-Claus et al. (2013)	Overall sample	Hallucinations	Momentary cognitive self-consciousness t-1	2.02	0.080	Not reported
Palmier-Claus et al. (2013)	Overall sample	Hallucinations	Momentary cognitive self-consciousness t	5.87	<.001	Not reported
			Momentary cognitive self-consciousness t (negative affect t-1; negative affect t)	Not reported	0.001	Not reported
			Momentary cognitive self-consciousness t (positive affect t-1; positive affect t)	Not reported	<.001	Not reported
			Momentary cognitive self-consciousness t (delusions t-1; delusions t)	Not reported	0.002	Not reported
Palmier-Claus et al. (2013)	Overall sample	Hallucinations	Activity-related stress t	1.10	0.004	Not reported
Palmier-Claus et al. (2013)	Overall sample	Hallucinations	Social stress t	1.09	0.144	Not reported
Palmier-Claus et al. (2013)	Overall sample	Hallucinations	Event-related stress t	2.89	0.005	Not reported
Peters et al. (2012)	Overall sample	Delusions	Negative affect t	0.68	<.001	Not reported

Peters et al. (2012)	Overall sample	Delusions	Positive affect t	-0.38	<.001	Not reported
Peters et al. (2012)	Overall sample	Auditory hallucinations	Negative affect t	0.30	<.001	Not reported
Peters et al. (2012)	Overall sample	Auditory hallucinations	Positive affect t	-0.19	<.001	Not reported
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Aberrant salience t (gender, ethnicity, level of education, employment status)	0.19	<.001	0.16 to 0.21
Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Aberrant salience t (gender, ethnicity, level of education, employment status)	0.24	<.001	0.21 to 0.26
Reininghaus et al. (2016)	Control sample	Psychotic experiences	Aberrant salience t (gender, ethnicity, level of education, employment status)	0.17	<.001	0.14 to 0.21
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Threat anticipation t (gender, ethnicity, level of education, employment status)	0.15	<.001	0.13 to 0.17
Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Threat anticipation t (gender, ethnicity, level of education, employment status)	0.12	<.001	0.10 to 0.14
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Threat anticipation t (gender, ethnicity, level of education, employment status)	0.10	<.001	0.08 to 0.12
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Social stress t (gender, ethnicity, level of education, employment status)	0.51	<.001	0.42 to 0.60
Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Social stress t (gender, ethnicity, level of education, employment status)	0.50	<.001	0.43 to 0.57

Reininghaus et al. (2016)	Control sample	Psychotic experiences	Social stress t (gender, ethnicity, level of education, employment status)	0.42	<.001	0.33 to 0.51
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Social disconnectedness t (gender, ethnicity, level of education, employment status)	0.64	<.001	0.58 to 0.70
Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Social disconnectedness t (gender, ethnicity, level of education, employment status)	0.71	<.001	0.65 to 0.77
Reininghaus et al. (2016)	Control sample	Psychotic experiences	Social disconnectedness t (gender, ethnicity, level of education, employment status)	0.58	<.001	0.48 to 0.68
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Event-related stress t (gender, ethnicity, level of education, employment status)	0.65	<.001	0.55 to 0.75
Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Event-related stress t (gender, ethnicity, level of education, employment status)	0.52	<.001	0.43 to 0.61
Reininghaus et al. (2016)	Control sample	Psychotic experiences	Event-related stress t (gender, ethnicity, level of education, employment status)	0.47	<.001	0.35 to 0.60
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Activity-related stress t (gender, ethnicity, level of education, employment status)	0.55	<.001	0.48 to 0.63
Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Activity-related stress t (gender, ethnicity, level of education, employment status)	0.55	<.001	0.49 to 0.60
Reininghaus et al. (2016)	Control sample	Psychotic experiences	Activity-related stress t (gender, ethnicity, level of education, employment status)	0.43	<.001	0.36 to 0.51
Reininghaus et al. (2016)	FEP sample	Psychotic experiences	Area-related stress t (gender, ethnicity, level of education, employment status)	0.90	<.001	0.80 to 0.99

Reininghaus et al. (2016)	ARMS sample	Psychotic experiences	Area-related stress t (gender, ethnicity, level of education, employment status)	0.72	<.001	0.61 to 0.83
Reininghaus et al. (2016)	Control sample	Psychotic experiences	Area-related stress t (gender, ethnicity, level of education, employment status)	0.68	<.001	0.54 to 0.81
Sitko et al. (2016)	Overall sample	Paranoia	Self-esteem t-1 (paranoia t-1; attachment insecurity t-1)	0.01	>0.001	-0.07 to 0.09
Sitko et al. (2016)	Overall sample	Paranoia	Attachment insecurity t-1 (paranoia t-1)	0.17	<.001	0.09 to 0.25
			Attachment insecurity t-1 (paranoia t-1; auditory hallucinations t)	0.14	0.001	0.06 to 0.22
			Attachment insecurity t-1 (paranoia t-1; self-esteem t-1)	0.14	0.001	0.06 to 0.22
Sitko et al. (2016)	Overall sample	Auditory hallucination	Attachment insecurity t-1 (auditory hallucinations t-1)	1.29	<0.05	1.03 to 1.60
			Attachment insecurity t-1 (auditory hallucinations t-1; paranoia t)	1.21	>0.05	0.97 to 1.51
Thewissen et al. (2008)	Overall sample	Paranoia	Change in self-esteem between t-1 and t	0.17	<.001	Not reported
			Change in self-esteem between t-1 and t (gender; depressive mood t; paranoia t-1)	0.17	<.001	Not reported
Thewissen et al. (2011)	Overall sample	Paranoia	Anxiety t-1 (adjusting for paranoia t-1 and auditory hallucinations t)	1.25	<0.05	1.13 to 1.59
Thewissen et al. (2011)	Overall sample	Paranoia	Down t-1 (adjusting for paranoia t-1 and auditory hallucinations t)	0.92	Not reported but not significant	0.81 to 1.15
Thewissen et al. (2011)	Overall sample	Paranoia	Anger/irritability t-1 (adjusting for paranoia t-1 and auditory hallucinations t)	1.06	Not reported but not significant	0.96 to 1.28
Thewissen et al. (2011)	Overall sample	Paranoia	Self-esteem t-1 (adjusting for paranoia t-1; and auditory hallucinations t)	0.81	0.079	0.52 to 0.82
Udachina et al. (2009)	Overall sample	Paranoia	Negative self-esteem t-1 (experiential avoidance between t-1 and t)	0.09	<.001	Not reported
			Negative self-esteem t-1 (experiential avoidance between t-1 and t; depression t)	0.07	<.001	Not reported
			Negative self-esteem t-1 (experiential avoidance between t-1 and t; depression t; paranoia t-1)	0.02	0.32	Not reported
Udachina et al. (2009)	Overall sample	Paranoia	Positive self-esteem t-1 (experiential avoidance between t-1 and t)	-0.03	0.08	Not reported
			Positive self-esteem t-1 (experiential avoidance between t-1 and t; depression t)	-0.01	0.47	Not reported
			Positive self-esteem t-1 (experiential avoidance between t-1 and t; depression t; paranoia t-1)	-0.01	0.82	Not reported

Udachina et al. (2009)	Overall sample	Paranoia	Experiential avoidance t-1 (negative self-esteem t-1)	0.17	<.001	Not reported
			Experiential avoidance t-1 (negative self-esteem t-1; depression t)	0.13	<.001	Not reported
			Experiential avoidance t-1 (negative self-esteem t-1; depression t; paranoia t-1)	0.12	<.001	Not reported
			Experiential avoidance t-1 (positive self-esteem t-1)	0.18	<.001	Not reported
			Experiential avoidance t-1 (positive self-esteem t-1; depression t)	0.14	<.001	Not reported
			Experiential avoidance t-1 (positive self-esteem t-1; depression t; paranoia t-1)	0.12	<.001	Not reported
Udachina et al. (2014)	Overall Sample	Paranoia	Self-esteem t-1	-0.09	<.001	Not reported
			Self-esteem t-1 (paranoia t-1; negative mood t-1)	-0.04	<0.05	Not reported
			Self-esteem t-1 (experiential avoidance t-1)	-0.07	<0.05	Not reported
			Self-esteem t-1 (experiential avoidance t-1; negative mood t-1; paranoia t-1)	-0.04	0.055	Not reported
Udachina et al. (2014)	Overall Sample	Paranoia	Experiential avoidance t-1	0.11	<.001	Not reported
			Experiential avoidance t-1 (paranoia t-1; negative mood t-1)	0.05	<0.01	Not reported
			Experiential avoidance t-1 (self-esteem t-1)	0.10	<.001	Not reported
			Experiential avoidance t-1 (self-esteem t-1; negative mood t-1; paranoia t-1)	0.05	<0.01	Not reported
Varese et al. (2011)	Overall sample	Auditory hallucinations	Dissociation t-1	1.20	<0.01	1.05 to 1.36
			Dissociation t-1 (paranoia t)	1.17	<0.05	Not reported
Varese et al. (2011)	Overall sample	Auditory hallucinations	Experiential avoidance t-1	1.20	<0.05	1.04 to 1.40
			Experiential avoidance t-1 (paranoia t)	1.16	>0.05	0.98 to 1.36
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Dyad contact t	-0.04	0.62	-0.19 to 0.11
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Dyad contact between t-1 and t	-0.00	0.97	-0.11 to 0.10
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Dyad contact t-1	-0.14	0.14	-0.32 to 0.04
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Encouraging t	-0.01	0.90	-0.23 to 0.21

Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Encouraging between t-1 and t	-0.03	0.70	-0.20 to 0.13
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Encouraging t-1	0.18	0.16	-0.07 to 0.44
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Nagging t	0.15	0.46	0.25 to 0.55
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Nagging between t-1 and t	0.09	0.56	-0.21 to 0.38
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Nagging t-1	0.19	0.43	-0.28 to 0.65
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Helping t	0.02	0.82	-0.18 to 0.23
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Helping between t-1 and t	-0.08	0.35	-0.24 to 0.09
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Helping t-1	0.17	0.13	-0.05 to 0.39
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Taking control t	1.08	0.00	0.42 to 1.74
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Taking control between t-1 and t	-0.44	0.05	-0.88 to 0.01
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Taking control t-1	0.65	0.07	-0.04 to 1.33

Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Keeping an eye on t	0.00	0.98	-0.20 to 0.21
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Keeping an eye on between t-1 and t	0.09	0.32	-0.09 to 0.27
Vasconcelos e Sa et al (2016)	Overall sample	Psychotic experiences	Keeping an eye on t-1	0.11	0.36	-0.12 to 0.34
Verdoux et al. (2003)	Overall sample	Perceived hostility	Familiar individuals vs alone t (age; gender; cannabis use)	-0.52	<.001	-0.62 to -0.43
Verdoux et al. (2003)	Overall sample	Perceived hostility	Unfamiliar individuals vs alone t (age; gender; cannabis use)	-0.20	0.76	-0.18 to 0.13
Verdoux et al. (2003)	High vulnerability sample	Perceived hostility	Familiar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Perceived hostility	Unfamiliar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Perceived hostility	Familiar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Perceived hostility	Unfamiliar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Perceived hostility	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	-0.31	<.001	-0.42 to -0.20
Verdoux et al. (2003)	Overall sample	Perceived hostility	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Perceived hostility	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	0.20	0.002	0.07 to 0.33
Verdoux et al. (2003)	High vulnerability sample	Perceived hostility	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported

Verdoux et al. (2003)	High vulnerability sample	Perceived hostility	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Perceived hostility	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Perceived hostility	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Perceived hostility	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Perceived hostility	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Strange impressions	Familiar individuals vs alone t (age; gender; cannabis use)	-0.06	0.10	-0.14 to 0.01
Verdoux et al. (2003)	Overall sample	Strange impressions	Unfamiliar individuals vs alone t (age; gender; cannabis use)	0.07	0.20	-0.05 to 0.19
Verdoux et al. (2003)	High vulnerability sample	Strange impressions	Familiar individuals vs alone t (age; gender; cannabis use)	-0.21	0.07	-0.43 to 0.02
Verdoux et al. (2003)	High vulnerability sample	Strange impressions	Unfamiliar individuals vs alone t (age; gender; cannabis use)	0.14	0.49	-0.25 to 0.52
Verdoux et al. (2003)	Low vulnerability sample	Strange impressions	Familiar individuals vs alone t (age; gender; cannabis use)	-0.02	0.58	-0.09 to 0.05
Verdoux et al. (2003)	Low vulnerability sample	Strange impressions	Unfamiliar individuals vs alone t (age; gender; cannabis use)	0.05	0.46	-0.07 to 0.17
Verdoux et al. (2003)	Overall sample	Strange impressions	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Strange impressions	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported

Verdoux et al. (2003)	Overall sample	Strange impressions	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Strange impressions	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	-0.25	0.05	-0.50 to 0.00
			Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use; type of social company t)	-0.34	0.03	-0.64 to -0.04
Verdoux et al. (2003)	High vulnerability sample	Strange impressions	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	0.47	0.09	-0.07 to 1.01
			Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use; type of social company t)	0.79	0.07	-0.06 to 1.63
Verdoux et al. (2003)	High vulnerability sample	Strange impressions	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	0.22	0.16	-0.09 to 0.52
			Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use; type of social company t)	Not reported	Not reported but not significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Strange impressions	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	0.01	0.86	-0.08 to 0.10
Verdoux et al. (2003)	Low vulnerability sample	Strange impressions	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	0.04	0.59	-0.11 to 0.20
Verdoux et al. (2003)	Low vulnerability sample	Strange impressions	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	0.03	0.53	-0.07 to 0.13
Verdoux et al. (2003)	Overall sample	Thought influence	Familiar individuals vs alone t (age; gender; cannabis use)	0.06	0.14	-0.02 to 0.15
Verdoux et al. (2003)	Overall sample	Thought influence	Unfamiliar individuals vs alone t (age; gender; cannabis use)	0.04	0.58	-0.10 to 0.18
Verdoux et al. (2003)	High vulnerability sample	Thought influence	Familiar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
			Unfamiliar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Thought influence	Familiar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported

Verdoux et al. (2003)	Low vulnerability sample	Thought influence	Unfamiliar individuals vs alone t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Thought influence	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Thought influence	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Thought influence	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Thought influence	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Thought influence	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Thought influence	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Thought influence	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Thought influence	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Thought influence	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Unusual perceptions	Familiar individuals vs alone t (age; gender; cannabis use)	0.02	0.65	-0.05 to 0.08
Verdoux et al. (2003)	Overall sample	Unusual perceptions	Unfamiliar individuals vs alone t (age; gender; cannabis use)	0.06	0.29	-0.05 to 0.17
Verdoux et al. (2003)	High vulnerability sample	Unusual perceptions	Familiar individuals vs alone t (age; gender; cannabis use)	-0.04	0.73	-0.25 to 0.18

Verdoux et al. (2003)	High vulnerability sample	Unusual perceptions	Unfamiliar individuals vs alone t (age; gender; cannabis use)	0.38	0.04	-0.25 to 0.17
			Unfamiliar individuals vs alone t (age; gender; cannabis use; familiar location t)	0.44	0.03	0.06 to 0.84
			Unfamiliar individuals vs alone t (age; gender; cannabis use; anxiety t)	0.39	0.04	0.03 to 0.75
			Unfamiliar individuals vs alone t (age; gender; cannabis use; perceived hostility t)	0.38	0.05	0.00 to 0.74
Verdoux et al. (2003)	Low vulnerability sample	Unusual perceptions	Familiar individuals vs alone t (age; gender; cannabis use)	0.03	0.32	-0.03 to 0.10
Verdoux et al. (2003)	Low vulnerability sample	Unusual perceptions	Unfamiliar individuals vs alone t (age; gender; cannabis use)	-0.02	0.66	-0.13 to 0.08
Verdoux et al. (2003)	Overall sample	Unusual perceptions	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Unusual perceptions	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	Overall sample	Unusual perceptions	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Unusual perceptions	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	-0.09	0.50	-0.35 to 0.17
			Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use; type of social company t)	Not reported	Not reported but non-significant	Not reported
Verdoux et al. (2003)	High vulnerability sample	Unusual perceptions	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	0.85	0.003	0.29 to 1.40
			Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use; type of social company t)	0.93	0.03	0.09 to 1.80
Verdoux et al. (2003)	High vulnerability sample	Unusual perceptions	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	0.02	0.89	-0.33 to 0.29
			Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use; type of social company t)	Not reported	Not reported but not significant	Not reported
Verdoux et al. (2003)	Low vulnerability sample	Unusual perceptions	Changing to familiar individuals vs not changing between t-1 and t (age; gender; cannabis use)	0.05	0.18	-0.02 to 0.13
Verdoux et al. (2003)	Low vulnerability sample	Unusual perceptions	Changing to unfamiliar individuals vs not changing between t-1 and t (age; gender; cannabis use)	-0.03	0.65	-0.17 to 0.10

Verdoux et al. (2003)	Low vulnerability sample	Unusual perceptions	Changing to being alone vs not changing between t-1 and t (age; gender; cannabis use)	-0.02	0.60	-0.11 to 0.06
Weijers et al. (2018)	Overall sample	Psychotic experiences	Event-related stress t	0.03	0.06	-0.00 to 0.05
Weijers et al. (2018)	Overall sample	Psychotic experiences	Activity-related stress t	0.10	<.001	0.06 to 0.14
Weijers et al. (2018)	Overall sample	Psychotic experiences (onset)	Event-related stress t	-0.01	0.95	-0.20 to 0.19
Weijers et al. (2018)	Overall sample	Psychotic experiences (onset)	Activity-related stress t	0.39	0.01	0.09 to 0.70
Wigman et al. (2015)	Overall sample	Paranoia	Cheerful t-1	0.01	Not reported but not significant	Not reported
Wigman et al. (2015)	Overall sample	Paranoia	Insecure t-1	0.03	<0.05	Not reported
Wigman et al. (2015)	Overall sample	Paranoia	Content t-1	0	Not reported but not significant	Not reported
Wigman et al. (2015)	Overall sample	Paranoia	Down t-1	0.05	<0.05	Not reported

Appendix E: University Ethical Approval



Psychology & Mental Health Division Panel
 Division of Psychology & Mental Health
 Zochonis Building G32
 The University of Manchester
 Manchester
 M13 9PL
 Email: Clare.Hamnett@manchester.ac.uk

Ref 2018-4444-7230

12/10/2018

Dear Miss Kate Lawrence, , Dr Sandra Bucci, Dr Katherine Berry, Dr Peter Taylor

Study Title: Fluctuations in proximity seeking and paranoia

Psychology & Mental Health Division Panel

I write to thank you for submitting the final version of your documents for your project to the Committee on 09/10/2018 12:54. I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form and supporting documentation as submitted and approved by the Committee.

Please see below for a table of the titles, version numbers and dates of all the final approved documents for your project:

Document Type	File Name	Date	Version
Additional docs	ESM Items V1 final 15.05.18	15/05/2018	1
Additional docs	Person-level measures v1 final 15 05 18	15/05/2018	1
Consent Form	Consent Form V1 21.08.2018	21/08/2018	1
Participant Information Sheet	PIS V1 21.08.18	21/08/2018	1
Distress Protocol/Debrief Sheet	Debrief information- Sources of support and help V1 21.08.18	21/08/2018	1
Advertisement	Email advertisement V1 21.08.18	21/08/2018	1
Advertisement	Poster Fluctuations in Proximity Seeking & Paranoia v1 21.08.18	21/08/2018	1
Advertisement	Sona advertisement V1 21.08.18	21/08/2018	1
Advertisement	Twitter advertisement V1 21.08.18	21/08/2018	1
Advertisement	Website advertisement V1 21.08.18	21/08/2018	1
Additional docs	ESM Blurb (shown when participants click the link to access their online diary) Version 1 21.08.18	21/08/2018	1
Additional docs	ESM text message participants receive to their mobile phone Version 1 21.08.18	21/08/2018	1
Additional docs	Demographic questionnaire V1 21.08.18	21/08/2018	1
Additional docs	Research Subcommittee Approval	12/09/2018	1
Additional docs	Fluctuations_in_Proximity_Seeking_and_Paranoia_DMP	21/09/2018	1
Additional docs	PIS V2 03.10.18 Fully ammended version	03/10/2018	2
Additional docs	PIS V2 03.10.18 Track Changes	03/10/2018	2
Additional docs	Letter to Dr Daniel Pratt	03/10/2018	1

This approval is effective for a period of five years and is on delegated authority of the University Research Ethics Committee (UREC) however please note that it is only valid for the specifications of the research project as outlined in the approved documentation set. If the project continues beyond the 5 year period or if you wish to propose any changes to the methodology or any other specifics within the project an application to seek an amendment must be submitted for review. Failure to do so could invalidate the insurance and constitute research misconduct.

You are reminded that, in accordance with University policy, any data carrying personal identifiers must be encrypted when not held on a secure university computer or kept securely as a hard copy in a location which is accessible only to those involved with the research.

For those undertaking research requiring a DBS Certificate: As you have now completed your ethical application if required a colleague at the University of Manchester will be in touch for you to undertake a DBS check. Please note that you do not have DBS approval until you have received a DBS Certificate completed by the

University of Manchester, or you are an MA Teach First student who holds a DBS certificate for your current teaching role.

Reporting Requirements:

You are required to report to us the following:

1. [Amendments](#)
2. [Breaches and adverse events](#)

We wish you every success with the research.

Yours sincerely,

A large, handwritten signature in black ink that reads "D Pratt". The signature is written in a cursive style with a long horizontal stroke at the end of the name.A smaller, handwritten signature in black ink, appearing to be a stylized "D" followed by a horizontal line, enclosed within a thin black rectangular border.

Dr Daniel Pratt

Psychology & Mental Health Division Panel

Appendix F: Baseline Questionnaire Measures

Demographics

Age (Years):

Gender:

Ethnicity (PLEASE CIRCLE ONE):

White British

White other

Indian

Pakistani

Other Asian

Black African

Black Caribbean

Black other

Mixed

Other (please specify): _____

Attachment Figure

Please list three significant people in your life. These people should be people that you currently “feel a strong emotional tie to, regardless of whether this is positive negative or mixed” and whom you would like to go to for help or support when something bad happens to you, or you feel upset, whether or not you actually go to them. Please pick one person from this list who you are most likely to seek support from over the next two weeks.

Experiences in Close Relationship Scale-Short Form (ECR-S)

Instruction: The following statements concern how you feel in romantic relationships. We are interested in how you generally experience relationships, not just in what is happening in a current relationship. Respond to each statement by indicating how much you agree or disagree with it. Mark your answer using the following rating scale:

1	2	3	4	5	6	7
Strongly Disagree	Disagree	Slightly Disagree	Neutral	Slightly Agree	Agree	Strongly Agree

1. It helps to turn to my romantic partner in times of need.

2. I need a lot of reassurance that I am loved by my partner.

3. I want to get close to my partner, but I keep pulling back.

4. I find that my partner(s) don't want to get as close as I would like.

5. I turn to my partner for many things, including comfort and reassurance.

6. My desire to be very close sometimes scares people away.

7. I try to avoid getting too close to my partner.

8. I do not often worry about being abandoned.

9. I usually discuss my problems and concerns with my partner.

10. I get frustrated if romantic partners are not available when I need them.

11. I am nervous when partners get too close to me.

12. I worry that romantic partners won't care about me as much as I care about them.

Scoring Information:

Anxiety = 2, 4, 6, 8 (reverse), 10, 12

Avoidance = 1 (reverse), 3, 5 (reverse), 7, 9 (reverse), 11

Wei, M., Russell, D. W., Mallinckrodt, B., & Vogel, D. L. (2007). The experiences in Close Relationship Scale (ECR)-Short Form: Reliability, validity, and factor structure. *Journal of Personality Assessment*, 88, 187-204.

Paranoia Scale (Fenigstein and Venable 1992)

Please rate how applicable each belief is to you by selecting a number between 1 (not at all applicable to me) and 5 (extremely applicable to me).

	Not at all applicable to me				Extremely applicable to me
1 Someone has it in for me	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
2 I sometimes feel as if I'm being followed	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
3 I believe that I have often been punished without cause	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
4 Some people have tried to steal my ideas and take credit for them	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
5 My parents and family find more fault with me than they should	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
6 No one really cares much what happens to you	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
7 I am sure I get a raw deal from life	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
8 Most people will use somewhat unfair means to gain profit or advantage, rather than lose it	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
9 I often wonder what hidden reason another person may have for doing something nice for you	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
10 It is safer to trust no one	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
11 I have often felt that strangers were looking at me critically	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
12 Most people make friends because friends are likely to be useful to them	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
13 Someone has been trying to influence my mind	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
14 I am sure I have been talked about behind my back	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
15 Most people inwardly dislike putting themselves out to help other people	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
16 I tend to be on my guard with people who are somewhat more friendly than expected	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>
17 People have said insulting and unkind things about me	1 <input type="radio"/>	2 <input type="radio"/>	3 <input type="radio"/>	4 <input type="radio"/>	5 <input type="radio"/>

Daniel Freeman, Richard Bentall, Philippa Garety
 Persecutory Delusions: The assessment of persecutory ideation.
 Copyright © 2008 by Oxford University Press

Oxford Clinical Psychology | Oxford University Press

	Not at all applicable to me				Extremely applicable to me	
18	People often disappoint me	1	2	3	4	5
19	I am bothered by people outside, in cars, in stores, etc., watching me	1	2	3	4	5
20	I have often found people jealous of my good ideas just because they had not thought of them first	1	2	3	4	5

DASS21

Name:

Date:

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you **over the past week**. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

- 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

1 (s)	I found it hard to wind down	0	1	2	3
2 (a)	I was aware of dryness of my mouth	0	1	2	3
3 (d)	I couldn't seem to experience any positive feeling at all	0	1	2	3
4 (a)	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5 (d)	I found it difficult to work up the initiative to do things	0	1	2	3
6 (s)	I tended to over-react to situations	0	1	2	3
7 (a)	I experienced trembling (e.g. in the hands)	0	1	2	3
8 (s)	I felt that I was using a lot of nervous energy	0	1	2	3
9 (a)	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10 (d)	I felt that I had nothing to look forward to	0	1	2	3
11 (s)	I found myself getting agitated	0	1	2	3
12 (s)	I found it difficult to relax	0	1	2	3
13 (d)	I felt down-hearted and blue	0	1	2	3
14 (s)	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15 (a)	I felt I was close to panic	0	1	2	3
16 (d)	I was unable to become enthusiastic about anything	0	1	2	3
17 (d)	I felt I wasn't worth much as a person	0	1	2	3
18 (s)	I felt that I was rather touchy	0	1	2	3
19 (a)	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20 (a)	I felt scared without any good reason	0	1	2	3
21 (d)	I felt that life was meaningless	0	1	2	3

SOCIAL COMPARISON SCALE

Please circle a number at a point which best describes the way in which you see yourself in **comparison to others**.

For example:

Short 1 2 3 4 5 6 7 8 9 10 Tall

If you put a mark at 3 this means you see yourself as shorter than others; if you put a mark at 5 (middle) about average; and a mark at 7 somewhat taller.

If you understand the above instructions, please proceed. Circle one number on each line according to how you see yourself in relationship to others.

In relationship to others I feel:

Inferior	1	2	3	4	5	6	7	8	9	10	Superior
Incompetent	1	2	3	4	5	6	7	8	9	10	More competent
Unlikeable	1	2	3	4	5	6	7	8	9	10	More likeable
Left out	1	2	3	4	5	6	7	8	9	10	Accepted
Different	1	2	3	4	5	6	7	8	9	10	Same
Untalented	1	2	3	4	5	6	7	8	9	10	More talented
Weaker	1	2	3	4	5	6	7	8	9	10	Stronger
Unconfident	1	2	3	4	5	6	7	8	9	10	More confident
Undesirable	1	2	3	4	5	6	7	8	9	10	More desirable
Unattractive	1	2	3	4	5	6	7	8	9	10	More attractive
An outsider	1	2	3	4	5	6	7	8	9	10	An insider

Appendix G: Experience Sampling Methodology Items

ESM Items

Please describe your mood just before you received the most recent prompt:

I feel....

	Not at all			Moderately			Very
▪ Sad	1	2	3	4	5	6	7
▪ Miserable	1	2	3	4	5	6	7
▪ Happy	1	2	3	4	5	6	7
▪ Tense	1	2	3	4	5	6	7
▪ Down	1	2	3	4	5	6	7
▪ Anxious	1	2	3	4	5	6	7
▪ Stressed	1	2	3	4	5	6	7
▪ Calm	1	2	3	4	5	6	7

Right now, I feel:

	Not at all			Moderately			Very
• That others dislike me	1	2	3	4	5	6	7
• That others might hurt me	1	2	3	4	5	6	7
• Safe	1	2	3	4	5	6	7
• Suspicious	1	2	3	4	5	6	7

Since the last prompt, the most important event to happen to me was:

.....

	Very Unpleasant			Moderate		Very Pleasant	
This was:	-3	-2	-1	0	1	2	3

The following items relate to the significant person you listed during the initial interview. Since the last prompt, I have:

- Attempted to contact my significant person YES/NO
- Tried to contact my significant person via:
 - Telephone Call
Number of times: 0, 1-2, 3-4, 5-6, 7-8, 9-10, 10+
 - Text messaging (including direct message applications such as WhatsApp)
Number of times: 0, 1-2, 3-4, 5-6, 7-8, 9-10, 10+
 - Email messaging
Number of times: 0, 1-2, 3-4, 5-6, 7-8, 9-10, 10+
 - Social Networking Sites (including Facebook, Instagram, Snapchat, etc.)
Number of times: 0, 1-2, 3-4, 5-6, 7-8, 9-10, 10+
 - Face-to-face contact
Number of times: 0, 1-2, 3-4, 5-6, 7-8, 9-10, 10+

Appendix H: Participant Information Sheet



Participant Information Sheet

Fluctuations in proximity seeking and paranoia

You are being invited to take part in a research project. Before you decide whether you would like to take part, it is important for you to know why the research is being done and what it will involve. Please read the following information carefully, with others if you wish. Please feel free to speak to the researchers about any questions you have or if you would like more information.

Thank you for your time.

What is the research for?

This research project is interested in using a technique called 'Experience Sampling Methodology (ESM)'. ESM is a relatively new methodology which looks at people's thoughts and feelings on a *moment-by-moment* basis. This is done by asking participants to answer some questions in an online ESM diary at random time points throughout the day. The aim of the research is to understand how proximity seeking behaviour may be related to our attachment to the significant people in our lives, particular emotions and thinking patterns that occur in our day-to-day lives.

What will I be asked to do?

This study will involve answering some questions about your thoughts, feelings, behaviour and experiences. Initially, we will meet you at the University of Manchester where you will be asked for some personal details (e.g. age, gender, ethnicity, phone number) and to fill in some questionnaires (e.g. "I found it difficult to relax," rated on a scale from 'Did not apply to me at all' to 'Applied to me very much or most of the time'). This initial session will take no longer than one hour.

Following the initial assessment, we would like you to fill in an online diary when prompted by text messages sent to your mobile phone (example question: “I feel sad,” rated on a scale from ‘Not at all’ to ‘Very Much’). This will occur at six random-times per day between 10am and 10pm for two weeks. Each complete entry should take no longer than two or three minutes to fill in and we will go through some practice questions with you before you start.

We will meet with you following completion of the online diaries to give you some further questionnaires to complete. This second session will take no longer than one hour and will take place at the University of Manchester.

Who is doing the research and who has approved it?

The research is being conducted by a Trainee Clinical Psychologist at the University of Manchester. This work is being supervised by Dr Sandra Bucci (Senior Lecturer and Clinical Psychologist at the University of Manchester), Dr Katherine Berry (Senior Lecturer and Clinical Psychologist at the University of Manchester) and Dr Peter Taylor (Lecturer and Clinical Psychologist at the University of Manchester).

Who can take part?

Participants must be 18 years or over, and have sufficient fluency in English to be able to understand and respond to the questionnaire items. Participants must have access to a smart mobile phone. Participants must have had at least one romantic relationship in their lifetime.

Why have I been offered the chance to take part?

You have been offered the chance to take part because you are either currently a student at the University of Manchester, or you are a member of the general public with an interest in participating in research.

Do I have to take part?

No, it is up to you whether you would like to take part. If you do decide to participate you are free to withdraw at any time without giving a reason, and without consequence.

What are the possible disadvantages of taking part?

As part of the research, participants will be asked to complete measures relating to their mood and feelings. For some individuals completing such measures may be uncomfortable or lead to feelings of distress. Participants have the option to withdraw from the research at any point and do not need to answer any questions they do not wish to. All participants will be offered information about sources of support should they need it. Dr Sandra Bucci, Dr Katherine Berry and Dr Peter Taylor are qualified Clinical Psychologists and will be able to discuss any concerns participants may have.

Will there be benefits to taking part?

Taking part in this research will allow you to try out a new and exciting research methodology: Experience Sampling Methodology (ESM). The results of the research will help inform interventions (e.g. talking therapies) that would therefore benefit future generations of students as well as the wider population.

Participants will be given £10 to say thank you for taking part.

If you are a University of Manchester Psychology student you may, alternatively, receive 10 research credits for taking part.

What will happen if I want to stop taking part?

You have the right to leave the study at any point, without needing to give any explanation. Should you wish to do this, simply tell the researcher (either by phone, email or face-to-face). If you choose to leave the study you will also have the option of having the data you supplied destroyed. However, once you have completed the study it will not be possible to ask for your data to be removed, as we will have no way of identifying which sets of answers are your own.

What if I am unhappy or there is a problem?

If you wish to complain or have any concerns about any aspect of the way you have been treated during this study, you can approach the study supervisor Dr Sandra Bucci (0161 306 0400 or sandra.bucci@manchester.ac.uk). Alternatively, you can contact The Research Governance and Integrity Manager by emailing research.complaints@manchester.ac.uk or by telephoning 0161 275 2674. When contacting the Research Governance and Integrity

Manager, please provide details of the name or description of the study (so that it can be identified), the researcher(s) involved, and the details of the complaint you wish to make.

Will my taking part in this research be confidential?

Yes it will. Upon completion of the study, or withdrawal from the study, all responses will be anonymised, which means that no one will know your identity or which responses are yours. During the study personal information which identifies you (for example, your contact details) will be stored separately to any other information you supply (e.g. completed questionnaires). You will be asked to provide your mobile telephone number as a text message containing a link to the online ESM diary will be sent to your mobile phone at the six random-time-points. You will log into the online ESM diary using a unique participant number and will create your own password in order to access the online ESM diary thereby ensuring anonymity. Your mobile phone number will therefore not be linked to the responses you provide to the questions in the online ESM diary. Personal information will be destroyed once you either complete, or withdraw, from the study.

The only exception to this is if you wish to hear about the results of the study. In this instance contact details will be stored securely in a locked filing cabinet, but it will not be possible to link these contact details to any other information you have supplied as part of the study.

Your responses will only be viewed by the researchers involved in the study. All information collected for this research project will be kept safely and securely on a University of Manchester password-protected computer for 10 years in a central file store in line with University of Manchester policy for the storage of research data. Anonymous hard copies of completed questionnaires will be stored in a locked filing cabinet on University grounds for no more than 10 years. Access to data by researchers not involved in the current study will be subject to further ethical review.

We are collecting and storing this personal information in accordance with the General Data Protection Regulation (GDPR) and Data Protection Act 2018 which legislate to protect your personal information. The legal basis upon which we are using your personal information is “public interest task” and “for research purposes” if sensitive information is collected. For more information about the way we process your personal information and comply with data protection law please see our [Privacy Notice for Research Participants](#).

You have a number of rights under data protection law regarding your personal information. For example you can request a copy of the information we hold about you, including personal details and questionnaires. This is known as a Subject Access Request. If you would like to know more about your different rights, please consult our [privacy notice for research](#) and if you wish to contact us about your data protection rights, please email dataprotection@manchester.ac.uk or write to The Information Governance Office, Christie Building, University of Manchester, Oxford Road, M13 9PL. at the University and we will guide you through the process of exercising your rights.

You also have a right to complain to the [Information Commissioner's Office](#), Tel 0303 123 1113

What will happen when the research ends?

Data will be analysed and the results will be written up. You will be contacted by the research team if you have told us that you would like to be kept informed of the results of the research.

Who can I contact for further information?

Kate Lawrence kate.lawrence@postgrad.manchester.ac.uk

This Project has been approved by the University of Manchester's Research Ethics Committee

[2018-4444-7230]

Thank you for taking the time to read this. You should keep this information sheet for future reference.



The University of Manchester

Appendix I: Participant Consent Form

Consent Form

Participant Identification Number:

Title of Project: Fluctuations in proximity seeking and paranoia

Name of Researcher: Kate Lawrence

		Please initial the box
1	I confirm that I have read and understood the Participant Information Sheet dated 15/05/2018 (version 1) for the above study. I have had the chance to think about the information, ask questions and have my questions answered.	
2	I understand that taking part is voluntary and that I can change my mind at any time without giving a reason, and without consequence.	
3	I give permission for the researchers to have access to my personal information, as detailed in the Participant Information Sheet dated 15/05/2018 (version 1).	
4	I understand that any personal information collected and used to conduct this research will be processed in accordance with data protection law as explained in the Participant Information Sheet dated 15/05/2018 (version 1) and the Privacy Notice for Research Participants.	
5	I agree to take part in the above study.	

6	I agree that if I decide to withdraw from the study then the researchers can continue to use the anonymised data and information I have already given them unless I ask for this to be destroyed.	
7	I would like to receive a summary of the findings at the end of study.	
8	I agree to my data being used for further studies looking at the role of attachment and cognition in voice-hearing.	

Name of participant	Date	Signature
---------------------	------	-----------

Name of person taking consent	Date	Signature
-------------------------------	------	-----------

When completed: 1 for participant; 1 for researcher site

Appendix J: Participant Debrief Sheet



The University of Manchester

Sources of support and help

Difficulties with distressing feelings, such as anxiety and depression, and difficult or hard to explain experiences, such as often thinking that others want to harm you, are common in the UK but can have a huge impact upon a person's life. If you have been struggling with these experiences, either in the past, or since taking part in this study, there are a number of sources of support available to you.

- It may be helpful to talk to your GP about these feelings
- There are a number of helplines dedicated to providing support to those struggling with depression, anxiety and other difficult emotions:
 - **Samaritans** (08457 90 90 90; open 24 hours).
 - **Saneline** (0845 767 8000; 6pm-11pm daily).
 - **Mind Infoline** (0300 123 3393; Monday- Friday 9am- 6pm, email: info@mind.org.uk, website: www.mind.org.uk)
 - **Rethink Mental Illness** (0300 5000 927; Monday-Friday 9am-4.30pm, email: info@rethink.org, website: www.rethink.org)
 - **Elefriends** (email: elefriends@mind.org.uk, website: www.elefriends.org.uk)
 - **Hearing Voices Network** (0114 271 8210, email: nhvn@hotmail.co.uk, website: www.hearing-voices.org)
 - **National Paranoia Network** (0114 271 8210, website: www.nationalparanoianetwork.org)
 - **Anxiety UK** (08444 775 774; Monday-Friday 9.30am-5.30pm, website: www.anxietyuk.org.uk/)
- Your University also has a Counselling service which can help

- **University of Manchester Counselling Service** (0161 275 2864, www.studentnet.manchester.ac.uk/counselling, counselling.service@manchester.ac.uk)
- You are also welcome to contact the study researcher, who will be able to suggest possible sources of support
 - Kate Lawrence (kate.lawrence@postgrad.manchester.ac.uk)

Many thanks again for your participation in our research. Should you have any further queries, please do not hesitate to contact one of the research team.