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An Exploration of Self-Compassion and Psychosis

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Abstract

Psychosis is an umbrella term used to describe a specific set of experiences, including hallucinations, delusions and paranoia. Psychotic experiences are understood to lie on a continuum and are therefore experienced by both clinical and non-clinical samples. Whilst some individuals may experience little distress from their experiences and not require specialist support, other experiences can be severe, enduring and affect friendships, employment and romantic relationships. When considering the adverse effect psychosis can have, research exploring the aetiology and treatment of psychosis is of great importance. This thesis aims to build on the current understanding in this area, utilizing three distinct chapters.

The first chapter aims to provide background and context for the following two chapters. It provides an in-depth exploration of the continuum nature of psychosis, a critical literature review of the current understanding of psychosis and alternative perspectives of psychosis to the traditional medical model. The second chapter systematically reviews existing research, exploring whether compassion focused interventions improve therapeutic outcomes within samples experiencing psychosis. The final chapter is an original piece of quantitative research exploring whether cognitive theory of mind mediates the relationship between developmental trauma and paranoia in a non-clinical population when controlling for self-compassion.

It is hoped that overall narrative of the thesis has clinical benefit, identifying helpful considerations for the assessment, formulation and intervention of psychosis like experiences. Both research chapters have been written for following guidelines for The British Journal of Psychology, please see Appendix O for the rationale and relevant author guidelines.

A Note to the Reader,

Hyperlinks have been included within this document to improve overall readability. Links have been included 1) each time an appendix has been cited, taking readers to the relevant page, 2) within the header of the document, taking readers back to the Table of Contents, and 3) within headings included in the Table of Contents, allowing readers to return to their desired section.

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Research Thesis: Declaration of Authorship

Print name: Megan Rodgerson

Title of thesis: An Exploration of Self-Compassion and Psychosis

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

I confirm that:

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

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Psychosis as a Continuum - A Bridging Chapter

Introduction

This chapter aims to provide a contextual base for the overall thesis, bridging the content of the systematic review and empirical project. It will discuss the nature of psychosis, including its definition, symptomology and prevalence, and explore on the experiences of psychosis across clinical and non-clinical populations. It will then outline the medical model of psychosis and offer alternative perspectives, including the continuum of psychosis and the Power Threat Meaning Framework (PTMF). This was identified as a useful focus for this chapter, given the exploration of psychosis across clinical and non-clinical populations in the following two chapters.

Before that, it is important to note that experiences of psychosis will be referred to as 'symptoms of psychosis' throughout the thesis for both clinical and non-clinical populations. Whilst some previous research has used the term 'psychosis-like experiences' to describe these experiences within non-clinical populations (Brett et al., 2014; Larøi et al., 2014), this term has been used interchangeably with 'symptoms of psychosis' across other research (Kelleher et al., 2010; Verdoux & van Os, 2002). 'Symptoms of psychosis' was chosen for the current thesis to improve consistency, with all three chapters exploring symptoms of psychosis across both clinical and non-clinical populations.

Background of Psychosis

Psychosis is an umbrella term used to describe a collection of symptoms which affect thoughts, perceptions and behaviours (Parnas et al., 2010). These symptoms can be categorised into two subgroups, positive symptoms and negative symptoms (National Institute of Mental Health [NICE], 2025). Positive symptoms refer to an individual's experiences which are unshared by those around them, such as hallucinations, paranoia and delusions (American Psychiatric Association [APA], 2013). These experiences may influence how an individual perceives the world, sometimes leading to a different sense of reality to those around them (Bangwal et al., 2020). In contrast,

negative symptoms are defined by the reduction or absence of internal experiences, such as thoughts and feelings (Bangwal et al., 2020). These may be observed through behaviours, including reduced speech, blunted affect and decreased motivation (APA, 2013).

Whilst negative symptoms are common characteristics of overall clinical presentations of psychosis, the presence of these symptoms in isolation would not typically meet the diagnostic criteria for psychosis-related disorders (Lundin et al., 2024). Instead, clinical guidelines state that at least one positive symptom must be present for a psychosis-related diagnosis to be established (NICE, 2025). The necessity for positive symptoms to be present for diagnostic criteria to be met perhaps reflects their uniqueness to psychotic-related diagnoses. In comparison, negative symptoms are observed in a range of different mental health presentations in addition to psychosis, such as depression (Richter et al., 2019).

Whilst psychosis is often associated with formal mental health diagnoses, such as schizophrenia (Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition [DSM-V], 2013), it is perhaps a misconception that psychosis is experienced exclusively by clinical populations with formal mental health diagnoses. Previous research has highlighted that symptoms of psychosis can also be experienced by individuals without formal mental health diagnoses, in non-clinical populations, who do not present to mental health services (Baumeister et al., 2017; Carvalho et al., 2014; Freeman et al., 2005). In fact, across a large, cross-national survey, 12.5% of the general population reported experiencing at least one symptom of psychosis (Nuevo et al., 2012). Whilst these findings highlight the commonality of these experiences, it is possible that they remain an underestimate of the true prevalence of psychosis symptoms across non-clinical samples due to difficulties in capturing data of such a widespread nature (Public Health England, 2016), and stigma relating to psychosis preventing people from reporting their experiences (Ahmed et al., 2020).

The Continuum of Psychosis

When considering the experiences of psychosis across clinical and non-clinical populations, it may be helpful to think of symptoms as lying on a continuum. This continuum is continuous in nature and distributes individuals based on the severity of their symptoms. Individuals at the upper end of the continuum may experience more significant symptoms of psychosis which are often chronic in nature, whereas individuals at the lower end of continuum may experience symptoms that are less significant and may be fleeting in nature (van Os, 2003).

Whilst the same symptoms of psychosis can be observed across the entire continuum (Verdoux & van Os, 2002), individuals at the upper end of the continuum experience these symptoms differently to individuals at the lower end of the continuum (DeRosse & Karlsgodt, 2015). For example, when using the Revised Greens Paranoid Thoughts Scale, some paranoid thoughts were frequently observed across both clinical and non-clinical samples who would be spread across the entire continuum, such as 'there might be negative comments being circulated about me' (Carvalho et al., 2014). In contrast, paranoid thoughts of a more intense nature, such as 'I might be being observed or followed', were identified more frequently in the clinical samples who were more likely to sit at the upper end of the continuum (Carvalho et al., 2014). Similar findings have been identified when looking at auditory hallucinations. Whilst non-clinical samples were more likely to report hearing people call their name whilst 'half-asleep', clinical samples were more likely to report hearing voices of a higher quality and intensity, even when fully awake (Stanghellini et al., 2012).

In addition to differences in the content of these symptoms, a continuum effect has also been observed in the severity and frequency of these symptoms. For paranoia, clinical samples were more likely to hold their beliefs with stronger conviction than individuals in the non-clinical sample (Carvalho et al., 2014). For auditory hallucinations, clinical samples were more likely to experience voices with an increased quality and intensity (Stanghellini et al., 2012), on a more frequent basis (Baumeister et al., 2017). These findings demonstrate that whilst symptoms of psychosis were observed across both clinical and non-clinical populations, a continuum of effects can be identified for

both the severity of the symptoms, including in the content, intensity and frequency of these experiences.

Despite these differences, it is thought that the experiences of psychosis across clinical and non-clinical populations are conceptually similar. Previous research has supported this, 1) hypothesizing similar underlying cognitive mechanisms within both populations (Esterberg & Compton, 2009), 2) identifying construct validity between the experiences of psychosis in clinical and non-clinical populations (Kelleher & Cannon, 2011) and 3) observing similar brain activity across both populations whilst experiencing hallucinations (Baumeister et al., 2017).

Other research has indicated a linear relationship between clinical and non-clinical experiences of psychosis, highlighting the prevalence of non-clinical experiences of psychosis responded in a 'dose-dependent' manner to the prevalence of clinical experiences of psychosis (van Os et al., 2001). Results indicated that across five different localities ranging from 'very urban' to 'very rural', with higher prevalence of symptomology identified in urban areas. These findings suggest that the experiences of psychosis across clinical and non-clinical populations are somewhat related, responding the same way to different environmental factors.

Challenging the Medical Model

Allowing individuals from both clinical and non-clinical populations to be placed on the same continuum challenges the traditional, medical model of psychosis. The medical model of psychosis theorizes that biological markers are responsible for the development of psychosis and recommends that medication is prescribed to alleviate symptoms (McCulloch et al., 2005). Using a strict diagnostic criterion, it separates individuals into two distinct, binary groups. The first group have symptoms of psychosis that meet diagnostic threshold for formal mental health diagnoses. The second group do not meet the diagnostic threshold for formal mental health diagnoses and are therefore assumed to not experience symptoms of psychosis at all. Whilst this view of psychosis may have some merit and has supported the development of medication which remains a first-line treatment for clinical

presentations of psychosis (NICE, 2025), it does not account for individuals who do not meet the threshold for formal diagnosis and yet continue to experience symptoms of psychosis to a lesser degree.

The validity of the medical model for psychosis-related disorders has long been questioned (Read, 2013). Initial concerns about the usefulness of the diagnostic criteria for schizophrenia were raised in a paper by Richard Bentall (1993). Bentall (1993) argued that schizophrenia as a diagnosis should be 'rejected' due to 1) the lack of a core set of symptoms experienced consistently by all individuals with the diagnosis, 2) poor understanding of trajectory following diagnosis, with outcomes better predicted by social circumstances rather than symptomology, and 3) the limited effect of anti-psychotic medication experienced by some individuals. Bentall (1993) suggested that instead of using this diagnostic framework to make sense of psychosis symptoms, a more nuanced approach which takes individual's personal experiences into account would be more helpful.

The Power Threat Meaning Framework (PTMF)

Since the paper by Bentall (1993), there has been an emphasis to understand symptoms of psychosis in a different way, using psychological formulation to explore the role of an individual's life experiences in their current difficulties. One alternative perspective to the medical model is the PTMF (Johnstone & Boyle, 2018). The PTMF suggests that symptoms of psychosis are developed in response to threats, such as racism or bullying (Johnstone & Boyle, 2018). It proposes that when an individual is exposed to threats that are higher than the resources they have available to protect themselves, unconscious survival strategies are developed as 'threat responses', such as an overactive fight, flight or freeze response (Ball et al., 2023).

The PTMF suggests that symptoms of psychosis should be considered in this way, as internal states subconsciously developed to protect an individual from future harm. For example, the PTMF suggests that paranoid thoughts such as 'people want to harm me' are developed in response to interpersonal threats. Whilst these thoughts are viewed as 'symptoms' of a biological disorder within

the medical model, the PTMF argues they have a protective function, preventing an individual from connecting with others and therefore reducing the risk of future interpersonal harm. As another example, the PTMF suggests that delusions of grandiosity are developed in response to experiences which threatened an individual's self-esteem. The subconscious development of these grandiose views would protect the individual from experiencing poor self-worth following the threatening event, which may have otherwise led to negative self-appraisals or feelings of inferiority. Whilst these are helpful examples to outline how the application of the PTMF for the current chapter, a more in-depth discussion across several other symptoms of psychosis can be found in Ball et al. (2023).

Acknowledging symptoms of psychosis can be distressing in themselves, the PTMF highlights the importance of exploring how an individual makes sense of their symptoms (Ball et al., 2023). It is possible that whilst symptoms of psychosis are developed in response to threat, they may further activate the threat system should the individual have negative appraisals of their symptoms and experience symptom-related distress. It is therefore important that as part of the formulation, conversations are held relating to how individuals make sense of not only the initial threatening experience, but also subsequent symptoms of psychosis which were developed as a response to this threat.

The PTMF's ability to capture how an individual makes sense of their experiences is helpful, given that psychosis as a concept is based in Westernized ideology (Dutta et al., 2007), and that symptoms of psychosis are perceived differently cross-culturally (Taylor, 2023). Some cultures perceive symptoms of psychosis negatively, and individuals within these cultures report experiencing stigma after disclosing their experiences (Ahmed et al., 2020). In contrast, other cultures perceive symptoms of psychosis as positive, powerful experiences (Luhrmann et al., 2015) and may interpret auditory hallucinations as the voices of spirits there to guide or comfort them (Luhrmann et al., 2023). These differing perspectives highlight the importance of considering cultural perspectives when formulating experiences of psychosis using the PTMF. Whilst individuals in some cultures may have negative appraisals of these experiences which further activate their threat system, others have positive appraisals which may in fact soothe an active threat system (Ball et al., 2023).

Application to the Systematic Review and Empirical Project

Thus far, this chapter has explored the non-binary nature of psychosis, highlighting a continuum of symptoms which can be observed across both clinical and non-clinical populations. The chapter will now discuss the implications of these findings, providing rationale for the inclusion of non-clinical samples within the following two chapters of the thesis.

The systematic review aimed to explore the benefits of compassion focused interventions (CFIs) on therapeutic outcomes in both clinical and non-clinical populations. The decision to include both clinical and non-clinical populations was to ensure the most relevant and comprehensive narrative of existing research within this area. Furthermore, it was hoped that additional clinical implications may be identified through the inclusion of both clinical and non-clinical samples. For example, the presence of psychosis symptoms within non-clinical samples was found to significantly predict later, clinical presentations of psychosis (Hanssen et al., 2005; Fisher et al., 2013), in which individuals sought support for their experiences from healthcare services (Rekhi et al., 2017). Given that early treatment of psychosis symptoms reduces the chance of symptoms increasing in severity in the future (Stafford et al,, 2013), there is an argument for identifying effective psychological interventions which can be provided as soon as possible.

For the empirical project, a non-clinical sample was recruited to explore the mediating role of cognitive theory of mind between developmental trauma and paranoia. This was due to 1) the preliminary nature of this area of research, and 2) time constraints of the project reducing the feasibility of a large clinical population being recruited.

Conclusion

This bridging chapter aimed to provide a useful introduction for the overall thesis, setting a contextual basis for the utility of research across clinical and non-clinical populations who experience symptoms of psychosis. It has presented literature which has supported the argument that psychosis lies on a continuum and can be experienced outside of formal mental health diagnoses. It has also

argued that the medical model of psychosis is reductionistic, and that its binary understanding of psychosis does not account for the presence of psychosis symptoms within non-clinical populations, Instead, alternative models of psychosis have been presented, which formulate life experiences as contributive factors in the development of symptomology, such as the PTMF. Finally, it discussed how these alternative understandings of psychosis are helpful when reading the remainder of the thesis, which will explore symptoms of psychosis across clinical and non-clinical populations.

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Exploring the Benefit of Compassion-Focused Interventions for Psychotic Experiences: A Systematic Review

Exploring the Benefit of Compassion-Focused Interventions for Psychotic Experiences: A Systematic Review

Abstract

This systematic review synthesizes existing research, providing a comprehensive narrative of the benefits of compassion focused interventions (CFIs) on therapeutic outcomes for individuals experiencing psychosis. The review includes papers which measured the effectiveness of a CFI (group or individual) using standardized outcome measures within clinical and non-clinical populations. 1,589 papers were screened, 18 were included in the final write up. Quality assessments were completed using the CCAT. A meta-analysis was not possible due to the methodological differences across the papers, however, SWiM and PRISMA guidelines were followed to increase robustness of the review. Papers supported the use of CFIs for individuals experiencing psychosis in both clinical and non-clinical samples. Whilst a range of therapeutic benefits were identified, they were often not consistent across all papers. Improvements in psychosis symptom severity were observed in all non-clinical samples and some clinical samples. Eight studies included follow-up measures and indicated long-lasting improvements. Some therapeutic outcomes did not change during the intervention and significantly improved after six-to-twelve-weeks only. Whilst the use of CFIs were supported by all papers, several studies utilized small samples in feasibility studies or case studies. Future research is required with larger samples, control groups and follow-up measures.

Keywords:

Compassion-Focused Interventions, Psychosis, Therapeutic Outcomes, Systematic Review

Introduction

Psychosis is an umbrella term used to describe a set of symptoms which influence an individual's perception of the world around them (Parnas, et al., 2010). Whilst psychosis is characterized by both positive and negative symptoms, experiences of psychosis vary between individuals and not all symptoms are experienced by every person (NICE, 2025a). Positive symptoms are internal, unshared experiences which may influence an individual's perception of external reality, such as paranoia, hallucinations or delusions (Bangwal et al., 2020). Negative symptoms refer to the absence of typical thoughts, emotions or behaviours in everyday experiences, such as blunted affect, anhedonia and reduced speech (Marder & Galderisi, 2017).

Research suggests that psychotic experiences lie on a continuum and are experienced by individuals with and without formal mental health diagnoses (Verdoux & van Os, 2002). The spectrum is understood to be based on the severity and frequency of the experiences, with individuals at the lower end of the spectrum experiencing less frequent and less severe psychotic experiences than individuals at the upper end of the spectrum (Van Os, 2003). Mental health diagnoses relating to psychosis are often associated with experiences on the upper end of the spectrum (DeRosse & Karlsgodt, 2015), with diagnoses such as schizophrenia categorized by the severe and longstanding nature of the psychotic experiences (Keith & Matthews, 1991).

Despite this, it is important to note that the presence of a mental health diagnosis does not in itself indicate more severe experiences than somebody who does not have a formal diagnosis. Factors, such as cultural beliefs about psychosis (Rosenthal Oren et al., 2021) and the level of distress experienced due to psychosis symptoms (Lincoln, 2007), have been identified as potentially influencing a person's relationship with help. Therefore, it is possible that an individual's experience of psychosis may be significant enough that they would be placed on the upper end of the spectrum, despite not having a formal mental health diagnosis

Whilst the continuum hypothesis is helpful in understanding psychosis, it can make documenting prevalence rates of psychosis difficult due to the underreporting in the general population (Public Health England, 2016). One research study suggested up to 12.5% of the general

population have experienced at least one symptom of psychosis (Nuevo et al., 2012), and 0.28% of the global population are diagnosed with schizophrenia (Charlson et al., 2018). Whilst this may appear a relatively low prevalence rate for schizophrenia, this equates to 20 million individual cases across the world, with higher levels reported in Western (Jongsma et al., 2019) and urban cultures (Vassos et al., 2012). This high prevalence rate, and other adversities associated with psychosis, including distress (Kelleher et al., 2015), difficulties in daily functioning (Viertiö et al., 2012), physical illness (Samele et al., 2007) and unemployment (Ramsay et al., 2011), mean it is essential that appropriate support for individuals is provided.

What constitutes 'appropriate support' for these populations will differ dependent on the severity of their experiences. For example, schizophrenia is understood to be a life-long condition and therefore support may focus on living a meaningful life alongside the symptoms, rather than trying to alleviate them in their entirety (Lehman et al., 2012). Despite this, one identified recovery rates of 14.2% in individuals with schizophrenia, when recovery was defined as improvements in clinical and social outcomes observed for at least two years (Jääskeläinen et al., 2010). Individuals whose experiences are less severe may not readily seek support (Bak et al, 2003), however, help should be made available for all of those who need it. This is because subclinical symptoms are often experienced early in the development of schizophrenia, and this 'prodromal' phase can be predictive of later severe and chronic symptomology (Ruhrmann et al., 2003). The duration of untreated psychosis has also been directly associated with long term clinical prognosis, with quicker treatment being associated with better overall outcomes (Harrigan et al., 2003).

Recommendations for the treatment of psychosis have been outlined in the National Institute for Care and Excellence (NICE) guidelines. These include accessing secondary mental health services, prescription of anti-psychotic medication and crisis plans made in collaboration with mental health professionals and family members (NICE, 2025b). Further suggestions for psychological interventions are recommended, including individual Cognitive Behavioural Therapy (CBT), family therapy and art therapy (NICE, 2025b).

Research has identified consistent improvements in therapeutic outcomes using these approaches (Camacho-Gomez & Castellvi, 2020; Sitko et al., 2020; Tillquist, 2020), yet developing a broader range of effective, evidence based psychological therapies will further increase treatment options allowing clinicians to better tailor support plans to individual's needs. So far, these have included Acceptance Commitment Therapy (ACT) (Shawyer et al., 2017), Dialectical Behavioural Therapy (DBT) (Lawlor et al., 2022), and Compassion Focused Therapy (CFT) (Heriot-Maitland, 2024).

CFT is a relatively new psychological intervention which utilizes specific techniques to help an individual increase their internal sense of safety and their ability to show self-compassion. It was developed on an evolutionary theory that three internal systems are responsible for our thoughts, emotions and behaviours (Gilbert, 2009). These are 1) the drive system, responsible for motivating us to set out and achieve goals, 2) the threat system, responsible for detecting and responding to threats to maintain our safety, and 3) the soothing system, responsible for the regulation of emotions following the activation of the threat system and experiencing contentedness when in non-threat situations. With all three systems serving a purpose for daily functioning, CFT aims to support an individual to regulate their internal systems to ensure they can be activated or deactivated as required. Often, an individual needs support in downregulating the threat and drive systems whilst upregulating the soothing system, through the cultivation of self-compassion, internal warmth and acceptance (Gilbert, 2009).

The delivery of CFT differs, with variations in intervention format and length and frequency of sessions (Craig, et al., 2020; Gilbert, 2010). Despite this, similarities should be observed within the underlying principles, specific techniques chosen to support the individual and specialist training provided to therapists delivering CFT interventions (The Compassionate Mind Foundation, 2024). Whilst it is a relatively new approach, has gained support within clinical research and has been found to improve therapeutic outcomes in a range of different mental health presentations, including depression (Tiwari et al., 2018), social anxiety disorder (Gharraee et al., 2018) and post-traumatic stress disorder (Daneshvar et al., 2022).

Given the benefits of using CFT in the treatment of other mental health presentations, current research is investigating its utility as a psychological approach for psychosis particularly as studies have found a link between experiences of psychosis and low levels of self-compassion in both clinical (Eicher et al., 2013) and non-clinical samples (Scheunemann, 2019). When comparing specific symptomology within these populations, individuals who exhibited high levels of self-compassion also experienced fewer negative voices (Norman et al., 2020), reduced voice-related distress (Dudley et al., 2018) and decreased positive symptoms overall (Eicher et al., 2013; Scheunemann, 2019). Additionally, when exploring the experiences of recovery after psychosis using qualitative interviews, themes indicated that compassionate self-acceptance was a helpful process within this journey (Waite et al., 2015). When considering these links between the experiences of psychosis and self-compassion, it is possible that a CFT intervention which aims to increase self-compassion may have some therapeutic benefit.

When applying CFT to psychosis, the three systems model may help to explain why low levels of self-compassion are associated with increased symptomology. Theory suggests that individuals who experience psychosis have an overactive threat system (Heriot-Maitland et al., 2023), and an underactive self-soothe system (Gumley, et al., 2010). The overactivation of the threat system may help to explain experiences of psychosis related to a heightened sense of danger and hypervigilance around others, such as paranoia (Heriot-Maitland et al., 2023). Whilst theory suggests that the self-soothe system would then be activated to help the downregulation of negative internal experiences, individuals experiencing psychosis find the activation of the self-soothe system difficult (Gumley, et al., 2010). Without the activation of the self-soothe system, the individual would remain in the threat system and therefore not experience a sense of internal safety. This theory helps to explain why individuals who experience higher levels of self-compassion, demonstrating ability to activate their self-soothe system, experience lower levels of distress relating to their experiences (Maisey et al., 2021).

Whilst it is possible that individuals who experience psychosis have an overactive threat system, it is important to acknowledge the additional stressors which activate the threat system for

individuals experiencing psychosis in comparison to those who do not. Firstly, experiences of psychosis themselves can be very frightening, such as command hallucinations in which the individual hears a voice or voices which give them instruction to follow (Ellett et al., 2017). When considering the experience of command hallucinations, which increase an individual's risk of suicide (Harkavy-Friedman et al., 2003), it is perhaps unsurprising to find the threat system is more active in individuals who experience psychosis compared with those who do not.

Other external experiences may also activate the threat response, such as stigma. Individuals who experience psychosis have been found to experience discrimination by the public due to their experiences with psychosis, which in turn may lead to internalized self-stigma whereby the person experiences negative thoughts about themselves (Colizzi et al., 2020). Factors such as stigma may also perpetuate an underactive self-soothe system, with a vicious cycle between experiences of psychosis and self-criticism being identified by previous research (Waite et al., 2015). When interviewing individuals with psychosis, a theme emerged outlining the bidirectional nature of this relationship, in that self-criticism leads to increased experiences of psychosis, however, these experiences then lead the person to experience negative perceptions about themselves. In response to this, it was hypothesized that interventions which increase an individual's ability to demonstrate self-compassion would allow the regulation of the threat system when activated by self-criticism (Gumley et al., 2010).

When considering the application of the above theory to the experiences of psychosis, it appears logical that a compassion-based intervention may be helpful in supporting somebody with psychosis. Current research is looking at how CFT principles should be applied to the experiences of psychosis, with theory suggesting 1) the use of compassionate internal dialogue would promote recovery through the reappraisal of symptoms which activate the threat system (Gilbert, 2010), 2) techniques should be developed to enable acceptance of auditory hallucinations through kind responses, rather than trying to avoid them through fear (Maisey et al., 2021), and 3) the exploration of identity, with the acknowledgement that individuals are not defined by their experiences of psychosis (Chadwick et al., 2005).

With a theoretical base supporting the use of CFT for psychosis, research is implementing these principles to investigate whether improvements in therapeutic outcomes are observed following compassion-based interventions. This paper aims to systematically identify papers which have utilized a compassion-based intervention to treat psychosis, synthesize findings and provide a comprehensive narrative regarding the therapeutic outcomes following this intervention.

Whilst systematic reviews exist within this area of research, they have implemented different research questions, such as focusing on clinical populations trans-diagnostically (Craig, et al., 2020; Millard et al., 2023), populations diagnosed with schizophrenia (Mavituna et al., 2023), or focusing on how to apply CFIs, rather than on therapeutic outcomes following CFIs (Leach et al., 2024). Additionally, the current paper aims to capture the potential benefits of CFT across a wide range of outcome measures. This differs from previous reviews which focused on the benefits of CFTs on self-compassion only (Mavituna et al., 2023). When considering the above points, this review aimed to fill gaps in the current understanding and build upon the existing reviews to deepen the understanding of how compassion-based interventions are applicable to experiences of psychosis.

This review enhances the existing literature as it 1) focuses on the therapeutic outcomes following a compassion-focused intervention within populations experiencing psychosis, 2) includes both clinical and non-clinical samples who have experience of positive psychotic symptoms, to ensure the narrative is comprehensive and relevant to all individuals across psychosis continuum, and 3) includes only quantitative research papers to ensure that change scores can be accurately measured and compared. Using systematic, robust methodology, the current paper will add a comprehensive and novel contribution to the current literature base, exploring whether compassion-focused interventions improve therapeutic outcomes in populations experiencing positive psychotic symptoms.

Materials and Methods

To inform the design of the systematic review, the Population, Intervention, Comparison, Outcomes, and Study (PICOS) framework was implemented. The population was identified as adults (aged 14 or over) who experienced positive symptoms of psychosis, with or without a formal mental health diagnosis. The minimum age for participants was set at 14 to allow research conducted in adult

early intervention for psychosis teams (EIPs) to be included. This protocol has been used in previous systematic reviews in the area (Tiller et al, 2023).

The intervention consisted of a CFI which must include direct contact with a facilitator (in person, online, via telephone). No other restrictions were implemented relating to the intervention's delivery, including whether it was delivered in group format or individually, the length or frequency of sessions, and the facilitator's professional role. CFIs which were integrative with other psychological approaches were included.

Papers were included in the review only if they have utilized standardized, quantitative outcome measures. Outcome measures were required to have been completed before and after the CFI, allowing a change in therapeutic outcomes to be identified through the comparison of these scores. Studies were included in the review should they have either, 1) compared scores before and after a CFI when utilizing a single-arm design, or 2) compared change scores observed within the CFI group to change scores observed in a control group.

Whilst outcome measures must be standardized, quantitative in nature, they did not need to exclusively measure change in positive symptoms of psychosis. Other therapeutic outcomes would be included in the review, such as general wellbeing, distress and depression, due to 'improvement' in clinical presentation not defined solely by a reduction in the positive symptoms of psychosis.

Due to the aim of the review to synthesize findings relating to the clinical improvements, statistical analyses do not need to have been completed for a study to be included. Should statistical analyses have not been completed, data must be instead presented as descriptive statistics to allow change in scores across therapeutic outcomes to be observed.

To ensure scientific robustness, the review follows Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) guidelines (Moher, 2010). The review was also pre-registered via PROSPERO on 20/02/2025, prior to initial searches being completed (ID number, CRD42025644414). Whilst the title of the chapter has changed to improve readability, the protocol

was followed throughout the entire process of the systematic review. The review was funded by The University of Southampton, with no conflicting interests to declare.

Search Strategy

Psychological databases including Medline, APA PsycArticles, APA PsycInfo, Cinahl Ultimate and Embase were searched for relevant papers on 23/02/2025. These databases were identified as holding the highest number of relevant papers for the intended research question. To identify grey literature, further searches were completed on Google, Google Scholar and the Open Access Theses and Dissertations. The study protocol included DART-Europe in the search strategy for grey literature, however, the database closed on 03/02/2025 which meant this could not be completed. To ensure the review was as current as possible, a final search was completed on 18/04/2025 to identify any papers published after the initial searches. No restrictions were set in relation to publication date.

Search terms included:

"compass*" OR "Compassion focused therapy" OR "CFT" OR "self-compassion" OR "compassionate mind training" OR "compassionate imagery intervention" OR "compassionate focused intervention"

AND

"schizo*" OR "psychosis" OR "psychotic" OR "hallucination" OR "hear* voices" OR "delusion*" OR "fixed beliefs" OR "paranoi*" OR "schizoaffective disorder" OR "Schizophrenia" OR "Voice hearing" OR "Positive symptoms" OR "paranoid" OR "Psychosis-like experiences" OR "PLEs" OR "Perceptual abnormalities" OR "thought disturbance" OR "thought disorder" OR "disorgani?ed behavio#r" OR "disorgani?ed speech"

Inclusion and Exclusion Criteria

The inclusion and exclusion criteria were defined in accordance with the research question and PICOS framework. The inclusion criteria specified that papers must, 1) be written in English, 2) include samples who experience positive psychotic experiences (i.e., hallucinations, paranoia, delusions, thought disorder, speech disorder), specified by self-reports and/or outcome measures relating to positive symptoms of psychosis and/or clinical diagnosis, 3) include a CFI which consists of direct interaction with a facilitator, 4) use standardized measures to record therapeutic outcomes, e.g. distress, quality of life, symptoms of psychosis, 5) use either a control group or baseline measures (pre and post outcome scores) as a comparator and 6) include a direct piece of research.

The exclusion criteria specified that papers will not be included if they 1) do not compare therapeutic outcomes with either baseline measures (pre-post outcome measures) or a control group, 2) do not include quantitative data, 3) utilize only a cross-sectional design, and 4) include a CFI which does not include direct contact with a facilitator (e.g., the use of only pre-recorded videos).

Screening and Selection

Following the search, screening was completed using computer software Rayyan. A second reviewer screened a minimum of 10% of papers at both title and abstract screening, and full text screening. This was to ensure that screening was completed reliably in accordance with the pre-defined inclusion and exclusion criteria. Any differences in opinion throughout the screening process were resolved through discussion, including all named authors. The second reviewer was blind to decisions made by the author at the point of screening.

Data Extraction

Papers which met the inclusion and exclusion criteria following full text screening underwent data extraction. Data extraction was completed by one reviewer, with extracted data including, participant demographics (e.g., age, gender, ethnicity), details relating to the CFI (e.g., intervention

length, format and frequency), measure of comparison (e.g., specific outcome measures used), results (e.g., attendance to the CFI, statistical analyses, conclusions), and any relevant critique offered in the discussion (e.g. strengths and limitations). All data was stored on Microsoft Excel.

Quality Assessment

Papers included in the final review were screened for bias using the Crowe Critical Appraisal Tool (CCAT) (Crowe, 2013). The CCAT assesses the quality of a paper by scoring eight different sections from one to five, with a maximum total score of 40. These scores are dependent on the subjective perception of the reviewer and are all reported in Table 2. The CCAT was chosen as an appropriate quality assessment tool due to its ability to validly review papers using different methodological design (Crowe, 2013; Crowe & Sheppard, 2011). Additionally, research has highlighted the CCAT has good reliability, with an intraclass correlation of 0.83 when used appropriately alongside the scoring guidelines (Crowe et al., 2012).

To ensure the tool was used appropriately in this review, a second reviewer screened a minimum of 10% of the final papers using the CCAT to increase inter-rater reliability. The second reviewer was blind to the author's scoring at the point of quality assessing. Both the main researcher and second reviewer utilized the standardized form and guidelines alongside each other. Whilst papers will not be excluded from the review solely on their CCAT score, study quality will be considered when interpreting results.

Data Synthesis

When synthesizing results, this review will separate individual and group CFIs. This is with the intention of providing accurate comparison of conceptually similar CFIs, with increased clinical relevance for clinicians who may be consulting this paper whilst designing a CFI. Ten studies utilized a group format for delivering the CFI, with the remaining eight studies offering CFIs delivered on a one-to-one basis. Rivera et al. (2023) used a longitudinal approach which consisted of both individual

and group interventions. As this study documented therapeutic change of one individual case study, it will be included with the one-to-one CFIs.

Results for each subgroup are presented through a narrative synthesis, accompanied by a results table. The results tables include data related to therapeutic change on standardized outcome measures, with p-values, confidence intervals, and effect sizes provided where available. Each table also contains a summary of key findings and outlines the limitations reported in each study. Within the results tables, studies using non-clinical samples are listed first (Brown, 2021; Burke et al., 2020; DeTore et al., 2023; Lincoln et al., 2013).

Meta-analyses were deemed unsuitable for the current review due to methodological differences across the papers, including participant demographics, choice of outcome measures and statistical analyses. In the aim of increasing scientific robustness, the review followed The Synthesis Without Meta-analysis (SWiM) guidelines (Campbell et al., 2020) available in Appendix D.

Results

Study Selection

Results from the searches identified 1,589 papers. The screening process is outlined in Figure S1, along with the number of papers excluded at each stage. Following full-text screening, 18 papers met the full inclusion criteria and were included in the review.

A second reviewer screened 100 papers at title and abstract screening. Three differences in opinion were resolved through conversation between the first and second reviewer. Two were excluded from screening due to being in chapter format with no direct pieces of research. The third was included in full text screening. At full text screening, ten papers were screened by a second reviewer. Whilst there were two differences in opinion between the first and second reviewer, this was resolved by discussion and both papers were included in the review.

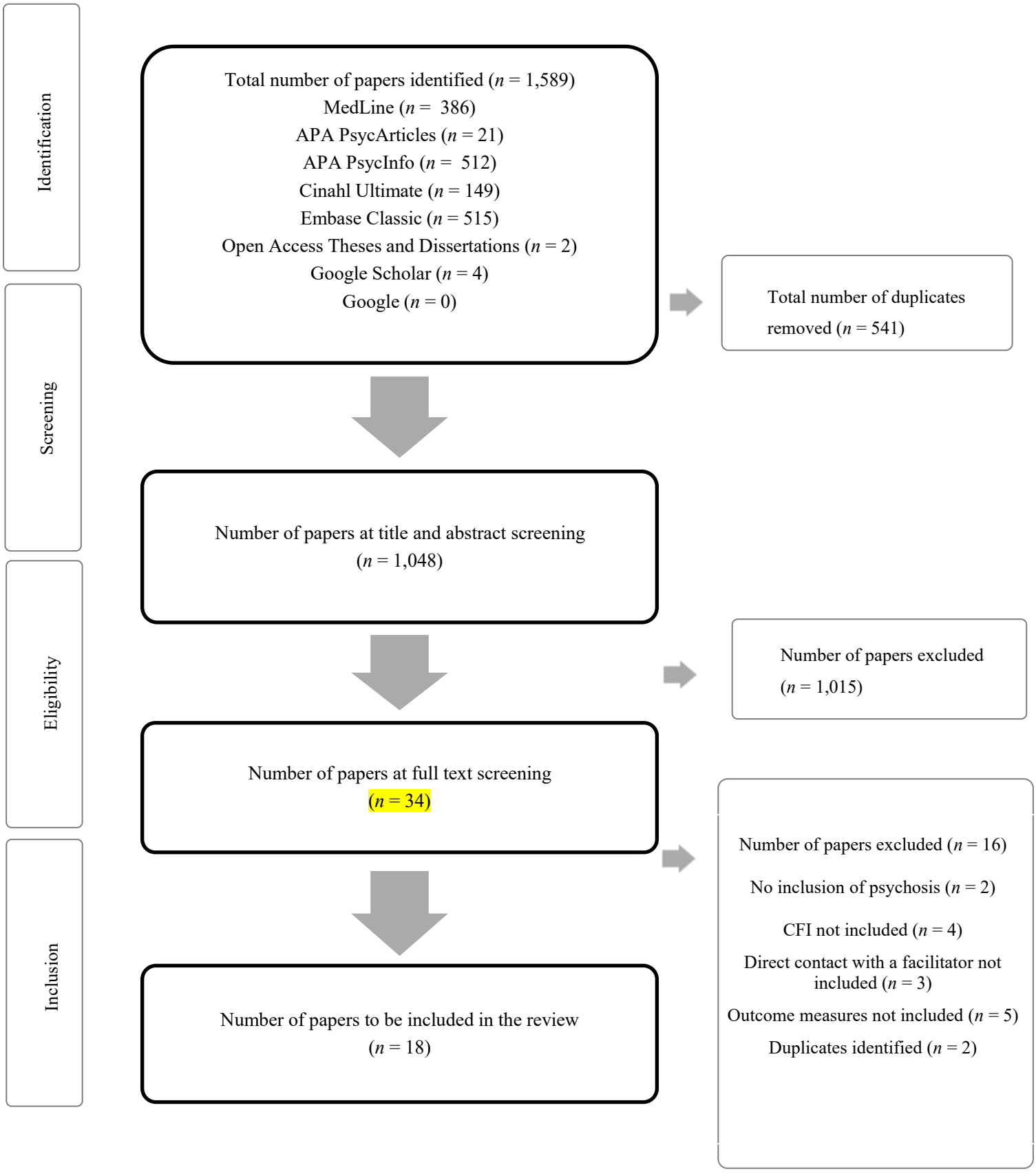
Study Characteristics

Study characteristics for the final papers are included in Table 1. Six studies were completed in the United Kingdom, two in America, two in Germany and Portugal, and one in Italy, Australia, Chile, Canada and the Netherlands.

The total combined sample size across all 18 studies was 656 participants, with an overall mean age of 32.60 years based on the 16 studies which provided this information. From the 12 papers that included age range, the range of participants was 14-66 years. Clinical samples were recruited in 13 papers. Of these, 12 included exclusively psychosis-related diagnoses and one included exclusively non-psychosis-related diagnoses. Four studies recruited non-clinical samples, three of which included only university students.

Figure S1

CONSORT Diagram Illustrating the Screening Process and Number of Studies at each Section



Quality Assessment using the CCAT

The CCAT quality assessment can be found in Table S2, papers have been put in order from highest to lowest overall score. Scores ranged from 16 (40%) to 33 (83%). A second reviewer assessed six papers (33.3%) using the CCAT. One difference in opinion was identified in relation to the total CCAT score, which was resolved with conversation.

Papers generally scored lower in the sampling and ethical matters sections in comparison to other sections. Reasons for low scores in the sampling section were largely a result of lack of detail, with limited descriptions of sampling methods, rationales for sample sizes (including power calculations), and inclusion and exclusion criteria. Reasons for low scores in ethical matters again resulted from lack of detail. Whilst all studies reported ethical approval, few acknowledged measures were taken to maintain confidentiality, debriefing participants and data storage. Whilst these measures were potentially completed at the point of design and data collection, hence ethical approval being received, the details were not included in the write-up and therefore could not be scored. The impact of these potential biases is considered in the discussion and implications for future research are discussed.

Finally, one paper received a score of 16 (Martins et al., 2017). Whilst the rationale and methodology of the paper was suitable, the results sections and discussion lacked detail, with not all included outcome measures being reported (Martins et al., 2017). These low scores indicate a potential risk of bias and will be considered when interpreting findings in the results tables below.

Table S1

Study Characteristics

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
Heriot-Maitland (2023), England	Non - concurrent, multiple baseline, case series	Single Arm	Clinical sample with a psychosis-related diagnosis Recruited from Secondary Care Mental Health Services	*n* = 7 Age = 36 – 64 *m* = 50.4 Sex: 28.6 % Female	*m* years with psychosis = 16	Individual, manualised Weekly, 1-hour sessions 26 sessions over 6-9 months Delivered in person Facilitated by a Clinical Psychologist
Braehler (2013), Scotland	Prospective, randomized, open-label, blinded end point evaluation	Control group receiving TAU	Clinical sample with a psychosis-related diagnosis Recruited from Community Mental Health Teams	*n* = 40 Age, *m* = 41.6 Sex: 47.5 % Female	*m* age of onset = 31.25 *m* years with psychosis = 20.7 Engaging in TAU whilst having CFI	Manualised group, *n* = > 7 Weekly, 2-hour sessions 16 sessions over 4-5 months Between session tasks encouraged Facilitated by two Psychologists
DeTore (2023), America	Randomized controlled study	Control waiting list group Control group offered CFI after 4 weeks	Non-clinical sample, college students Mildly elevated depressive or subclinical psychotic symptoms	*n* = 107 Age = 18 – 30 *m* = 18.82 Sex: 71 % Female	No formal mental health diagnoses or treatment from specialist services	Manualized group Weekly, 1.5-hour sessions 4 sessions over 4 weeks Integrative with mentalization and mindfulness. 1 CFI session

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
						Two facilitators per group, a psychologist, psychiatrist, or trainee psychologist
Ascone (2017), Germany	Repeated measures randomised control study	Control group exposed to neutral stimuli	Clinical sample with a psychosis-related diagnosis 36 inpatients, 15 outpatients	*n* = 51 Age = 18 – 65 *m* = 38.2 Sex: 29.4% Female	*m* number of psychotic episodes = 5.05 Prescribed anti-psychotic medication, *n* = 42	Individual, one-hour session using CFI scripts Delivered in person in a laboratory setting
Martins (2017), Portugal	Case studies	Single Arm	Clinical sample diagnosed with paranoid schizophrenia Recruited from a Community Mental Health Team	*n* = 2 Age = 22-35 *m* = 28.5 Sex: 0% Female	*m* age of onset = 19 *m* number of hospitalizations = 1.5 *m* years with psychosis = 7.5 Prescribed anti-psychotic medication, *n* = 2	Manualized, group, delivered in person Weekly, one-hour sessions 5 sessions over 5 weeks Homework, with handouts Facilitated by a Clinical Psychologist Integrative with mindfulness and acceptance. One CFI session
Mayhew (2008), England	Case series design	Single Arm	Clinical sample diagnosed with schizophrenia who experience	*n* = 3 Age = 16 - 65	*m* years with psychosis = 18.67	Individual, non-manualised, one-hour sessions 12 sessions in total

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
			hostile auditory hallucinations Recruited from Community Mental Health Team	*m* = 46.67 Sex: 0% Female		Facilitated by one Clinical Psychologist
Cheli (2020), Italy	Case series design	Single Arm	Clinical sample diagnosed with first episode psychosis diagnosis in the last 3 months	*n* = 6 Age = 19 - 27 Sex: 33.3 % Female	*m* number of psychotic episodes = 1 Prescribed antipsychotic medication, *n* = 6 All engaging in other psychology in addition to CFI	Individual Weekly, one-hour sessions 4 sessions over 4 weeks Audio files between sessions Delivered remotely Facilitated by one therapist
Forkert (2022), England	Uncontrolled feasibility	Single Arm	Clinical sample with diagnoses relating to non-affective psychosis. Minimum score of 29 on the GPTS - B Recruited from Secondary Mental Health Services	*n* = 12 Age = 18 - 65 *m* = 42 Sex: 58.3% Female	Prescribed antipsychotic medication, *n* = 11	Individual, manualised, one-hour sessions Twice weekly, 4 sessions over 2 weeks Homework, with handouts and auditory recordings Facilitated by a Trainee Clinical Psychologist

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
Heriot Maitland (2025), England	Mixed models	Single Arm	Clinical sample with a history of psychosis Recruited from community psychosis services	*n* = 109 Age = 18 - 66 *m* = 44 Sex: 72 % Female	Engaging in TAU whilst having CFI	Manualised group, *n* = 8, 1.5-hour sessions. 6 sessions over 6 weeks Delivered remotely, handouts provided Facilitated by a Clinical Psychologist and Assistant Psychologists
Hickey (2020), Australia	Non-randomised, longitudinal	Single Arm	Clinical sample diagnosed with a psychotic episode or schizophrenia Recruited from mental health services	*n* = 18 Age = 15-25 Sex: 59 % Female	Engaging in TAU whilst having CFI	Manualised group, 1.5-hour sessions 8 sessions over 8 weeks Homework encouraged Delivered in person Facilitated by two experienced clinicians
Rivera (2023), Chile	Case study	Single Arm	Clinical sample	*n* = 1 Age = 25 Sex: Female	Age of onset in years = 19 Years with psychosis = 6 Prescribed anti-psychotic medication and engaging in TAU	Individual and group sessions over 4 years facilitated by a psychiatrist Delivered in person, then moved to remote during the pandemic Homework, with audio recordings and support from family member
Laithwaite (2009), Scotland	Within-subjects design	Single Arm	Clinical sample with psychosis-related diagnoses	*n* = 19 Age, *m* = 36.9	N/A	Manualised group, twice weekly sessions 20 sessions over 10 weeks

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
			Recruited from a maximum-security hospital	Sex: 0% Female		Integrative with psychoeducation about psychosis. 1/3 based on CFI Delivered in person Three facilitators per group, from Clinical Psychologists, Assistant Psychologists, Trainee Clinical Psychologists and Advanced Practitioners
Burke (2020), America	Single arm, prospective study	Single Arm	Non-clinical sample of university students Recruited at university	*n* = 63 Age = 18 - 23 *m* = 19.33 Sex: 60 % Female	No formal mental health diagnoses or treatment from specialist services	Manualised group, *n* = 16, 4 x 1.5-hour sessions over 4 weeks Integrative with mentalization. 1 CFI session Delivered in person, homework tasks Facilitated by two psychologists
Khoury (2013), Canada	Non-randomised, prospective follow up study	Single Arm	Clinical sample with psychosis related diagnoses Recruited from a first episode of psychosis service	*n* = 27 Age, *m* = 29.08 Sex: 33.3% Female	*m* age of onset = 21.88 years *m* number of hospitalisations = 3 Engaging in TAU, but no other psychological input	Manualised group Weekly, 60–75-minute sessions 8 sessions over 8 weeks Integrative with mindfulness and acceptance. 3 CFI sessions. Homework tasks

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
						Facilitated by two therapists
Lincoln (2013), Germany	Randomised group comparison design	Control group exposed to neutral stimuli	Non-clinical sample of students Recruited at university	*n* = 71 Age = 18 - 50 *m* = 23.2 Sex: 69 % Female	N/A	Manualised one hour session Delivered in person Facilitated by master-level student of psychology with previous training in the application of the intervention
Rauschenberg (2021), Netherlands	Pilot study	Single Arm	Clinical sample of non-psychosis related diagnoses Psychotic symptoms screened with PQ and BSI Recruited from a Secondary Mental Health Centre	*n* = 10 Age = 14 - 25 *m* = 20.3 Sex: 30% Female	Engaging in TAU	Manualised, weekly group 3 sessions over 3 weeks Daily homework. Optional electronic app which sent reminders Delivered in person Facilitated by a psychologist
Martins (2018), Portugal	Pilot study	Single Arm	Clinical sample with psychosis related diagnoses	*n* = 10 Age, *m* = 28.5 Sex: 20% Female	*m* number of hospitalisations = 1.3 years	Manualised group, 2 x 1:1 sessions offered Weekly, 1.5 – 2-hour sessions 12 sessions over 12 weeks

First Author, Year, Country	Research Design	Use of Control Group	Population and Place of Recruitment	Participant Characteristics	Additional Information about Clinical Presentation	Details relating to CFT Intervention
			First episode of psychosis < 5 years ago Recruited from mental health hospitals			Homework, with compassionate message sent
Brown (2021), England	Between-groups	Control group exposed to neutral stimuli	Non-Clinical, with a total score of 22 or above on the GPTS – B Recruited via social media and radio advertisements in Oxfordshire	*n* = 100 Age, *m* = 29.05 Sex: 37% Female	N/A	Manualised, individual, one-hour session Delivered in person Facilitated by the researcher

Note. *m* = mean, TAU = treatment as usual. All other abbreviations in the table can be found in full in Appendix E.

Table S2

Quality Assessment Scores using the CCAT

Paper	Preliminaries	Introduction	Design	Sampling	Data Collection	Ethical Matters	Results	Discussion	Total Score	%
Lincoln et al., 2013	5	4	5	2	4	3	5	5	33	83
Heriot-Maitland et al. 2023	5	5	4	2	4	4	4	4	32	80
Ascone et al., 2017	5	4	4	4	4	3	4	4	32	80
Laithwaite et al., 2009	4	4	4	4	4	3	4	5	32	80
Burke et al., 2020	4	3	4	4	3	4	4	5	31	78
Rauschenberg et al., 2021	5	4	4	3	4	3	4	4	31	78
DeTore et al., 2023	4	5	4	5	2	3	4	3	30	75
Hickey et al., 2020	4	4	5	3	4	2	4	4	30	75
Brown et al., 2021	5	4	4	4	3	2	4	4	30	75
Fokert et al., 2022	4	4	5	3	4	2	4	4	30	75

Paper	Preliminaries	Introduction	Design	Sampling	Data Collection	Ethical Matters	Results	Discussion	Total Score	%
Braehler et al., 2013	4	5	4	2	4	3	4	3	29	73
Khoury et al., 2013	4	4	4	2	3	3	4	4	28	70
Heriot Maitland et al., 2025	5	3	4	2	4	3	4	3	28	70
Rivera et al., 2023	4	4	4	3	2	3	4	4	27	68
Mayhew & Gilbert, 2008	4	3	4	3	3	2	3	4	26	65
Martins et al., 2017	3	4	3	3	3	3	2	3	24	60
Cheli et al., 2020	3	2	4	1	3	3	3	3	22	55
Martins et al., 2018	2	3	3	2	1	3	1	1	16	40

Note. Higher scores represent lower risk of bias. Maximum total score of 40, with 5 points per item.

Outcome Measures

All studies used standardized outcome measures, as per the inclusion criteria. Please see Appendix E for a full list of measures used by each study. Across all papers, 59 different outcome measures were used, with papers each using between three and nine.

Overall clinical presentation was captured across the papers using the Clinical Global Improvement Scale (CGIS), the Symptoms Checklist-90 (SCL-90), the Brief Psychiatric Rating Scale (BPRS) and the Brief Symptom Inventory (BSI). The CGIS and BPRS both rely on clinician ratings based on observations of the individual. These items range from 7 to 18 and have been validated in clinical samples experiencing psychosis only (Andersen et al., 1986; Masand et al., 2011). The SCL-90 and BSI are self-report measures which ask individuals to rate their experiences on a five-point Likert scale. These measures have been validated in clinical and non-clinical samples (Akhavan Abiri & Shairi, 2020; Hafkenscheid, 1993; Long et al, 2007; Urbán et al., 2014).

To measure psychosis, some studies included generic measures which captured overall symptoms, including the Psychotic Symptom Rating Scale (PSYRATS), the Comprehensive Assessment of the At-Risk Mental State (CAARMS), the Positive and Negative Syndrome Scale (PANSS) and the Prodromal Questionnaire (PQ). These measures range from 17 to 30 items. The PSYRATS, PANSS and CAARMS utilize semi-structured interviews, with clinicians quantitatively scoring answers. The PQ is self-report measure and asks participants to rate their experiences on one-to-four Likert Scales. Whilst the CAARMS and PQ aim to identify sub-clinical levels of psychosis and have been validated in both clinical samples and non-clinical samples (Fusar-Poli et al., 2012; Ising et al., 2012; Loewy et al., 2005; Yung et al., 2005), the PSYRATS and PANSS have been validated for use in clinical samples only (Drake et al., 2007; Kay et al., 1988).

Other studies in psychosis included measures which focused on specific symptoms. Paranoia was recorded through the use of The Paranoia checklist (PC) and Green et al. Paranoid Thoughts Scales (GPTS). Voices were recorded using The Voice Rank Scale (VRS) and the Beliefs about Voices Questionnaire (BAVQ), delusions were captured using Peters Delusion Inventory (PDI). These

measures are all self-report Likert scales, ranging from 11 to 30 items each. Whilst the PC, PDI and GPTS have been validated in clinical and non-clinical samples (Freeman et al., 2005; Freeman et al., 2021; Hosseini et al., 2023; Peters et al., 1999; Sclier et al., 2016; Statham et al., 2019), the VRS and BAVQ have been validated in clinical samples only (Birchwood et al., 2000; Chadwick et al., 1995).

To capture depression, The Depression, Anxiety and Stress Scale (DASS-21), Beck Depression Inventory-II (BDI-II), Beck Depression Inventory – 1A (BDI – 1A), The Allgemeine Depressions Skala (ADS) were used. These measures range from 20 to 21 items, are all self-report in nature and utilize Likert scales. Whilst the DASS-21 and BDI-II have been validated in clinical and non-clinical samples (Henry & Crawford, 2005; Huppert et al., 2002; Lako et al., 2012; Wang & Gorenstein, 2013), the BDI-1A has been validated in non-clinical samples only (Lasa et al., 2000). Whilst the paper utilizing the ADS documented this tool as suitable for clinical and non-clinical samples, no reference relating to reliability or validity was provided (Lincoln et al., 2013).

Finally, measures of compassion included the Self-Compassion Scale—Short Form (SCS-SF), the Self Compassion Scale (SCS) and the Fears of Compassion Scale (FCS). Several studies also included measures which indirectly highlight changes in self-compassion, such as the Forms of Self-Criticizing /Attacking and Self- Reassuring Scale (FSCSR) and the Other as Shamer Scale (OaSS). Should an individual's ability to show self-compassion increase, it would be expected that scores on these measures would decrease. These measures range from 12 to 26 items, are all self-report in nature and use Likert scales. All of the above measures have been validated within non-clinical samples (Alfonsson et al., 2023; Castilho et al., 2015; Gilbert et al., 2011; Goss et al., 1994; López et al., 2015), however, to the authors knowledge, only the FCS has been validated in clinical samples experiencing psychosis (Castilho et al., 2021).

Whilst not all outcome measures were validated across both clinical and non-clinical samples, all outcomes in the narrative above relating to general symptomology, psychosis symptoms and depression were implemented in the appropriate samples. Outcome measures relating to self-compassion were utilized in clinical samples despite a lack of understanding of their psychometric properties in these populations.

Results Tables

CFIs Delivered Individually

CFI was delivered on a one-on-one basis in eight papers. Non-clinical samples were recruited by two papers (Brown, 2021; Lincoln et al., 2013) and all others recruited clinical samples. Three papers utilized an experimental design and delivered one off compassion-focused interventions (Ascone et al., 2017; Brown, 2021; Lincoln et al., 2013), with virtual reality utilized to simulate a real-life scenario in one paper (Brown, 2021). The CFI length in the remaining papers ranged from two weeks (Forkert et al., 2022) to nine months (Heriot-Maitland et al., 2023). A mixture of individual and group interventions which spanned over four years was used in one paper (Rivera et al., 2013).

Of the eight papers, three employed experimental designs, recruiting large samples for a one-off session (Ascone et al., 2017; Brown, 2021; Lincoln et al., 2013). The remaining papers all utilized small samples ($n > 12$). Clinical samples were recruited from secondary mental health services (Heriot-Mailand et al., 2023; Fokert et al, 2022; Mayhew & Gilbert, 2008) and inpatient and outpatient services (Ascone et al., 2017). Two papers did not report on recruitment methods (Cheli et al., 2020, Rivera et al. 2023). Across non-clinical samples, participants were recruited from university (Lincoln et al., 2013), and social media (Brown, 2021). A control group was present in three studies (Ascone et al., 2017; Brown et al., 2021; Lincoln et al, 2013).

A manualized or scripted CFI was utilized in five papers (Ascone et al., 2017; Brown, 2021; Fokert et al., 2022; Heriot-Maitland et al., 2023; Lincoln et al., 2013). All interventions included compassion focused imagery, such as, safe place imagery, perfect nurturer or compassionate colours. In-between session tasks were encouraged by three papers and included audiotapes ($n = 3$) or handouts (n = 1), (Cheli et al., 2020; Fokert et al., 2022; Rivera et al., 2023).

Facilitators included a master's student of psychology (Lincoln et al., 2013), psychiatrist (Rivera et al., 2023), clinical psychologists (Heriot-Maitland et al., 2023; Mayhew & Gilbert, 2008), trainee clinical psychologist (Fokert et al., 2022), therapist (Cheli et al., 2020), or the main researcher

(Ascone et al., 2017; Brown, 2021). Specialist CFI training or clinical supervision was detailed in six papers, with two papers mentioning neither (Ascone et al., 2017; Brown, 2021).

Therapeutic outcomes are detailed in Table S3. All papers identified therapeutic benefits for some of their chosen outcome variables. All papers identified significant findings for depression, when comparing baseline scores to post-treatment scores, or with scores from a control group. Of the papers which included measures of paranoia, four identified significant improvement (Brown, 2021; Fokert et al., 2022; Lincoln et al., 2013; Mayhew & Gilbert, 2008) and one identified no significant change (Ascone et al., 2017).

Follow-up measures were included in three papers and ranged from six weeks (Forkert et al., 2022; Heriot-Maitland; 2023) to six months (Mayhew & Gilbert, 2008). Therapeutic outcomes at follow up can be observed in Table S5. Whilst significant long-term change was observed for some outcomes in each paper, statistical significance cannot be determined in one paper which did not complete data analyses (Mayhew & Gilbert, 2008). Significant changes for depression, delusions and self-compassion were identified between the end of the CFI and the point of follow-up (Heriot-Maitland et al., 2023) indicating that these outcomes may be slower to improve than other outcomes.

Whilst the overall conclusion for each paper stated there had been therapeutic benefit in several outcome measures, one paper acknowledged there was no effect of group between the CFI and control group (Ascone et al., 2017). Other papers acknowledged their small sample sizes and were cautious about the generalizability of their findings, calling for studies with larger samples to be completed (Cheli et al., 2020; Fokert et al., 2022).

Finally, adverse effects from the CFI were not reported in any paper. This was only explicitly acknowledged by four papers (Ascone et al., 2017; Cheli et al., 2020; Fokert et al., 2022; Rivera et al., 2023). Attendance rates were reported by three papers, each reporting 100% (Cheli et al., 2020, Fokert et al., 2022; Lincoln et al., 2013). Two papers commented on attrition, with completion rates of 87.5% (Heriot-Maitland et al., 2023) and 71.43% (Mayhew & Gilbert 2008). Feedback from the participants was collected by two papers, following the CFI, which was generally positive (Ascone et al., 2017;

Fokert et al., 2022). Difficulties in practicing imagery techniques were reported by participants in one paper (Laithwaite et al., 2009), with another reporting only 50% of participants feeling 'very successfully' able to complete the imagery tasks (Rauschenberget al., 2021).

Table S3

Results Table for Papers which Included CFIs Delivered on an Individual Basis

First author, year	Outcome variables	Results	Main findings	Limitations
Lincoln (2013)	1) Paranoia 2) Depression 3) Self-Esteem	Repeated measures ANCOVA showed a sig time x condition interaction for paranoia, (F (1, 68) = 5.94, p = .017, d = 0.59). There were no sig. main effects for time (F (1, 67) = 0.94, p = .337) or condition (F (1,67) = 0.04, p = .852). Other outcome variables were used in mediation and moderation analyses and are therefore not included here. In the CFI group, descriptive statistics highlight no change in mean scores for depression [m = 1.1 (0.3)] at both time points and marginal improvement in self-esteem [pre m = 2.2 (0.6)], [post m = 2.3 (0.6)]. Significance cannot be determined due to lack of statistical analyses.	1) The CFI group experienced a larger decrease in paranoia in comparison to the control group. 2) The CFI was more beneficial for participants with higher levels of symptom severity.	1) Intervention was one hour long with no follow up measure, therefore it is unknown if changes are longstanding. 2) Lack of generalisability due to student sample. 3) Low scores of paranoia in some participants, floor effects may have influenced results.
Brown (2021)	1) Paranoia 2) Self- Compassion	Linear mixed effects regression models: 1) CFI group showed sig. lower levels of paranoia than the control group after interventions (1.73, 95% *C.I.*=-2.48, -0.98, p = <0.001, d = 0.80.) 2) CFI group showed sig. higher levels of self-compassion than the control group after interventions (2.12, 95% *C.I.*= 1.57;2.67, p = <0.001, d = 1.40.)	1) In comparison to the control group, the CFI group showed significantly lower levels of paranoia and higher levels of self-compassion.	1) Intervention was one hour long with no follow up measure, therefore it is unknown if changes are longstanding. 2) Low scores of paranoia mean it is not generalisable to samples with increased severity of symptoms.

First author, year	Outcome variables	Results	Main findings	Limitations
				3) Voluntary sample which may have affected the representativeness of the sample.
Heriot-Maitland (2023)	1) Psychosis Symptoms 2) Depression, Anxiety & Stress 3) Psychological Distress 4) Dissociation 5) Social Comparison 6) Self-Criticism and Self-Reassurance 7) Self-Compassion 8) Beliefs About Illness 9) Social Safeness	Group change between start and end of intervention using Wilcoxon Signed-Rank: psychosis symptoms (Z = -2.02, p = .043), depression (Z = -2.12, p = .034), anxiety (Z = -1.61, p = .106), stress (Z = -2.37, p = .018), distress (Z = -2.37, p = .018), dissociation (Z = -1.352 p = .176), social comparison (Z = -2.36, p = .018), self-inadequacy (Z = -2.21, p = .027), self-reassuring (Z = -2.37, p = .072), self-hate (Z = -2.37, p = .018), shame (Z = -2.37, p = .018), self-compassion (Z = -2.03, p = .043), beliefs about illness (Z = -2.37, p = .018). For social safeness, the Tau- U Omnibus showed a significant positive trend (Tau = .48, p < .001). Additional Reliable Change Indexes completed to look at change for each participant. Reliable improvement was observed for depression (5/7), stress (5/7), psychological distress (5/7), anxiety (4/7), self-compassion (4/7) and voices (3/5). See Table S5 for follow-up scores.	1) At group level, sig. improvements were identified for voices, delusions, depression, stress and psychological distress. No sig. change was identified for anxiety and dissociation. 2) Change in self-compassion, delusions and depression appeared to take longer than other outcomes, with increased sig. identified at follow up. 3) At an individual level, therapeutic outcomes varied between participants. Improvements were observed in most participants, but not all.	1) Potential for evaluation bias as an author of the paper is also the developer of CFT. 2) Normative data for psychosis populations was not available for some measures, therefore norms for the general population were used.

First author, year	Outcome variables	Results	Main findings	Limitations
Ascone (2017)	1) Paranoia 2) Self-Compassion 4) Self-Criticism and Self-Reassurance 5) Negative and Positive Affect	Repeated measures MANOVA for paranoia: no sig. group x time effect (F (1,49) = 0.40, *p* = .532, n2partial = 0.008). Sig. effect of time, reductions in paranoia across both groups (F (1,49) = 6.12, *p* = .017, n2 partial = 0.111). Omnibus, repeated measures ANOVA for self-criticism and negative affect: no sig. group x time effect (F (2,48) = 0.30, *p* = .742, n2partial = 0.012). Significant effect of time, improvements across both groups (F (2,48) = 27.39, *p* < .001, n2 partial = 0.533). Repeated measures ANOVA for self-compassion: no sig. group x time interaction (F (1,49) = 2.25, *p* = .140, n2 partial – 0.17). Repeated measures ANOVA for self-reassurance: sig. group x time effect (F (1,49) = 4.25, *p* = .045, n2partial = 0.04) Repeated measures ANOVA for self-positive affect: sig. group x time interaction (F (1,49) = 10.26, *p* = .002, n2 partial – 0.17).	1) Improvements were noted on all outcome measures apart from self-compassion. 2) However, improvements were noted in both the control and CFI group for paranoia, self-criticism and negative affect and there was no group effect. 3) Participants in the CFI experienced greater improvements in self-reassurance and positive affect in comparison to participants in the control group.	1) Issues with the recruitment process, potential bias for choosing patients which have less severe symptoms than others. 2) Intervention was one hour long with no follow up measure, therefore it is unknown if changes are longstanding.
Mayhew (2008)	1) Auditory Hallucinations 2) Self-Criticism 3) Self-Compassion 4) General Symptoms, including Depression,	Only descriptive statistics were reported in the form of histograms. Although significance cannot be determined, visual inspection highlights improvements in all outcome measures for all participants, apart from one participant experienced an increase in self-criticism.	1) Improvements were noted for all participants for depression, psychoticism, anxiety, paranoia, OCD and interpersonal sensitivity.	1) Exact results are unknown due to descriptive statistics being displayed in histograms only. Statistical power and significance of change is unknown due to lack of data analyses.

First author, year	Outcome variables	Results	Main findings	Limitations
	OCD, Anxiety, Paranoia, Psychoticism and Interpersonal Sensibility		2) 'Auditory hallucinations became less malevolent, less persecuting and more reassuring.'	2) Lack of control group and a small sample size (*n*=3) means limited generalizability.
Cheli (2020)	1) General symptomology 2) Depression, Anxiety & Stress	Reliable Change Index for general symptomology (*n* = 6), significance observed when RCI ≥ 1.96. P1) 2.14, P2) 2.94, P3) 1.15, P4) 2.25, P5) 1.96, P6) 2.18 Kendall's Tau for depression, anxiety & stress (n = 6): P1) -0.75, P2) -0.85, P3) -0.66, P4) -0.78, P5) -0.76, P6) -0.80 All reached the point of significance.	1) There is support for the use of an online CFI for individuals experiencing psychosis. 2) All participants experienced significant reduction in depression, anxiety and stress. Five out of six participants experienced an improvement in general symptomology.	1) Lack of control group and a small sample size (*n*=6) means limited generalizability. 2) Lack of follow up measure, therefore it is unknown if changes are longstanding.
Forkert (2022)	1) Paranoia 2) Self-Compassion 3) Negative Beliefs about Self and Others Positive Beliefs about Self and Others 4) Self-Esteem 5) Social Comparison	Improvements observed between pre and post CFI using repeated measures ANOVAs and pairwise comparisons, in paranoia (change score 10.08, 95% *C.I.* = 3.47, 16.69, *d* = 0.61), self-compassion (change score–0.64, 95% *C.I.* = 1.04,–0.24, *d* = –1.78), negative beliefs about self (change score 2.42, 95% *C.I.* = 0.37, 5.20, *d* = 0.51), negative beliefs about others (change score 3.92, 95% *C.I.* = 1.56, 6.27, *d* = 1.11), positive beliefs about the self (change score–3.25, 95% *C.I.* = 5.37,–1.13, *d* = –0.73) and others (change score–1.58, 95% *C.I.* = 4.23, 1.06, *d* = –0.51), self-esteem (change score	1) Improvements in all outcome measures were observed at the end of treatment and maintained at follow up. 2) This was predominantly a feasibility study; tentative interpretation of therapeutic outcomes	1) Lack of control group and a small sample size (*n*=12) means limited generalizability. 2) The intervention and outcome measures were delivered by a single, unblinded therapist,

First author, year	Outcome variables	Results	Main findings	Limitations
		3.58, 95% *C.I.* = 1.51, 5.65, *d* = 0.80), and self-comparison (change score– 324.92, 95% *C.I.* = 528.65, –121.19, *d* = –1.06)	is required due to small sample size (*n* = 12).	therefore potential of researcher bias.
Rivera, (2023)	1) Worry 2) Depression, Anxiety & Stress 3) Positive and Negative Affect 4) Self-esteem 5) Wellbeing 6) Mindfulness	Only scores following the CFI aspect of a 44-month intervention are included here. Sig. RCIs identified in worry (RCI = –19.46), depression, anxiety and stress (RCI = –11.04) and negative affect (RCI = –31.83), wellbeing (RCI = 2.11), No sig. RCI was observed in self-esteem or positive affect following the CFI, no statistics provided within the paper and are instead presented as line graphs.	1) This was a 44-month intervention integrated with other aspects of therapy, delivered individually and in groups. 2) Following the CFI component of the intervention, improvements were identified within worry, depression, anxiety, stress and wellbeing. 3) Mindfulness training acted as a strong foundation for later CFI.	1) Outcome measures chosen have not been validated for individuals with psychosis. 2) Only significant RCIs were reported, making it difficult to ascertain true affects. 3) Whilst the long nature of the study is a strength, it is not possible to distinguish from the CFT and MBI.

Note. *m* = mean, sig. = significant. Any abbreviations for outcome measures can be seen in full in Appendix E. Confidence intervals, *p* values and effect sizes are reported above, if they were reported in the original paper.

CFIs Delivered in Group Format

CFI was delivered on a group basis in ten papers. Non-clinical samples were recruited in two papers (Burke et al. 2020; DeTore et al., 2013), and clinical samples in the remaining eight. Clinical samples were recruited from secondary mental health services (Braehler et al. 2013, Heriot-Maitland et al., 2025; Martins et al., 2017, Rauschenberg et al., 2021), mental health services (Hickey et al., 2020), maximum security hospitals (Laithwaite et al., 2009) and mental health hospitals (Martins et al., 2018). Non-clinical samples were recruited from a university (Burke et al., 2020; DeTore et al., 2013,). A control group was present in one study (Braehler et al., 2013).

A manualized or scripted intervention was included in nine papers and one paper did not include this information (DeTore et al., 2013). Common themes across the groups included psychoeducation of CFT principles (including the three internal systems), compassionate imagery and mindfulness.

CFIs were integrated with other psychological approaches in six papers. The percentage of the intervention focused on compassion ranged from 20% (Martins et al., 2017) to 100% (Braehler et al, 2013; Heriot-Maitland et al., 2025; Rauschenberg et al., 2021). Other approaches included mindfulness and acceptance. Group length ranged from three (Rauschenberg et al., 2021) to 20 sessions (Laithwaite et al., 2009), with the mean CFI length 8.6 sessions. All groups were held weekly, apart from one which was held twice-weekly in a high-security setting (Rauschenberg et al., 2021).

Whilst in-between session tasks were not reported in two papers (DeTore et al., 2013; Laithwaite et al., 2009), handouts or audiotapes were provided to encourage practice in the other papers. Seven groups were facilitated by psychologists (with or without other mental health professionals), two by experienced clinicians or therapists (Hickey et al., 2020; Khoury et al., 2013), and one did not record its facilitator (Martins et al., 2018). Clinical supervision or compassion-focused training were mentioned by seven papers, with three papers mentioning neither, (Burke et al., 2020; Detore et al., 2023; Martins et al., 2018)

Therapeutic outcomes are detailed in Table S4. All papers identified significant improvements in some outcome measures and concluded CFI was a helpful intervention. However, consistent significant findings across all papers were identified for depression only, with varied findings identified for psychotic symptoms, self-compassion mindfulness and distress.

Follow-up measures were included in five papers, ranging from four weeks (Rauschenberg et al., 2021) to 12 months (Detore et al., 2023). Many of the outcomes which had significantly changed following the CFI, were maintained at follow-up, see Table S5 for full results. A significant improvement in clinical outcomes between the end of the intervention and at follow up was identified in three papers (Hickey et al. 2020, Khoury et al., 2013; Rauschenberg et al., 2021). They concluded that 1) some therapeutic benefits of CFIs are not observable immediately after the intervention but will emerge in time, and 2) some therapeutic benefits are observed at the end of the CFI, however, will continue to improve over time.

Regarding feasibility, six papers reported on attendance rates. Whilst there are differences in reporting styles across the papers, average attendance for the entire CFI ranged from 75% - 87% (Braehler et al., 2013; Burke et al., 2020). One paper reported 65% of participants attended at least five out of eight sessions (Hickey et al., 2020). Adverse effects were not reported in any paper, however, the lack of adverse effects was only explicitly stated in three papers (Braehler et al. 2013; Martins et al., 2017; Rauschenberg et al., 2021).

Finally, feedback following the CFI was obtained by six papers, although findings were not reported in one paper (Hickey et al., 2020). Whilst overall feedback indicated participants found the CFI helpful, participants found it difficult to complete the mindfulness or imagery tasks (Heriot-Maitland et al., 2025; Martins et al., 2017) and struggled with inconsistent engagement from other group members (Heriot-Maitland et al., 2025; Khoury et al., 2013).

Table S4

Results Table for Papers which included CFIs Delivered in Group Format

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
DeTore (2023)	1) Depression 2) Psychotic Experiences 3) Distress 4) Anxiety 5) Resilience 6) Self Compassion 7) Mindfulness 8) Empathy 9) Positive Affect	Repeated measures ANOVA to compare participants scores after CFI to participants on a waiting list. Sig. group x time interaction for, depression (F(1,86)=13.62, $p < 0.001$, ηp2=0.14), psychotic experiences (F(1,86)= 7.66, p =0.007, ηp2=0.08), distress (F(1,86)=7.46, p = 0.008, ηp2=0.08], anxiety (F(1,80)=5.86, p = 0.020, ηp2=0.07), resilience [F(1,46)=13.23, p =0.001, ηp2=0.22], self-compassion (F(1,46)=8.28, p =0.006, ηp2=0.15), mindfulness (F(1,46)=8.32, p =0.006, ηp2=0.15) and positive affect (F(1,80)= 5.11, p =0.03, ηp2=0.06). No sig. group x time effect for empathy (F(1,47)=0.57,p =0.46) or perspective taking (F(1,47),=0.004,p =0.95). T tests highlighted participants who engaged in CFI showed greater improvements in depression (t(86) =−3.69, $p < 0.001$, d = −0.78), psychotic experiences (t(86)= −2.77, p = 0.007, d=−0.58), distress (t(86) = −2.73, p = 0.008, d = −0.58), anxiety (t(80)= −2.42, p = 0.020, d = −0.53), resilience (t(46) = 3.64, p = 0.001, d = 1.04), self-compassion (t(46) = 2.88, p = 0.006, d = 0.82), mindfulness (t(46) = 2.89, p = 0.006, d = 0.79) and positive affect (t(80) = 2.26, p = 0.030, d = 0.48).	1) Participants in CFI experienced sig. greater clinical improvement than participants in a control group for depression, psychotic experiences, distress, anxiety, resilience, self-compassion, mindfulness and positive affect than the control group. 2) There were no differences between groups for empathy or perspective taking.	1) Lack of generalisability due to a largely white, female sample. 2) Including a waiting list group instead of a control group allows only tentative conclusions relating to the CFI.

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
Burke (2020)	1) Anxiety 2) Depression 3) Psychosis Symptoms 4) Distress 5) Self Compassion 6) Mindfulness 7) Mentalization 8) Social Motivation 9) Self-Efficacy	T-tests highlighted sig. improvement for anxiety ($t(59) = 3.18$, $p = .002$, $d = 0.41$), depression ($t(59) = 3.05$, $p = 0.003$, $d = 0.39$), psychosis symptoms ($t(59) = 4.13$, $p < 0.001$, $d = 0.53$), distress ($t(59) = 3.46$, $p = .001$, $d=0.45$), self-compassion ($t(59) = -2.93$, $p = .005$, $d = 0.38$), social motivation ($t(59) = -4.73$, $p < .001$, $d = 0.62$) and self-efficacy ($t(58) = -3.23$, $p = .002$, $d = 0.42$), T-tests highlighted no sig. improvement for mindfulness ($t(58) = -1.37$, $p = .176$, $d = 0.18$), mentalization via empathetic concern ($t(58) = 1.13$, $p = .263$, $d = 0.15$), and perspective taking ($t(58) = 0.15$, $p = .880$, $d = 0.02$),	1) Sig. improvements identified following CFI for anxiety, psychosis symptoms, distress, self-compassion, social motivation and self-efficacy only. 2) The brief nature of the CFI (4 sessions) was hypothesized as a contributive factor to the lack of change in mindfulness and mentalization.	1) Lack of control group means results cannot be definitively contributed to CFI. 2) Exclusive use of self-report measures due to the study's aim largely trying to ascertain feasibility over clinical benefit. 3) Lack of follow up measure, therefore it is unknown if changes are longstanding.
Braehler (2013)	1) Depression 2) Compassion and Avoidance 3) Beliefs about illness 4) General Symptomology 5) Positive and Negative Affect	Wilcoxon Signed Rank Tests highlighted a sig. improvement for compassion following the CFI ($z = -2.36$, $p = .02$, $r = -.59$). No sig. findings were identified for avoidance ($z = -1.63$, $p = .10$, $r = -.41$). No sig. findings were identified for the TAU group for compassion ($z = -1.23$, $p = .22$, $r = -.29$) or avoidance ($z = -1.28$, $p = .22$, $r = -.29$). A Mann Whitney U test highlighted sig. more compassion in CFI group in comparison to TAU at the end of treatment ($U = 75$, $Z = 2.43$, $p = 0.015$, $r = .42$). Note. Results were provided to two decimal points in the original piece of research.	1) CFI was associated with significantly greater clinical improvement than the control group receiving TAU. 2) 'Group CFT appears as a safe, acceptable, promising, and evolving intervention for promoting emotional recovery from psychosis.'	1) Variability in TAU across both groups makes it difficult to standardise the study. 2) Checks were not completed relating to standardisation of the treatment between therapists and groups. 3) Differences in control (TAU) and CFI group, sig. higher levels of depression in TAU.

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
		A Mann Whitney U Test identified a sig. difference between the CFI and TAU group following the interventions in general symptomology (U= 34.5; *Z*= 4.04; *p* <0.001, *r* = .68).		4) Lack of follow up measure, therefore it is unknown if changes are longstanding.
Martins (2017)	1) Paranoia 2) Shame 3) Self Criticism and Self-Reassurance 4) Psychological Acceptance & Avoidance 5) Mindfulness	Reliable Change Indexes were completed for two participants. RCIs for P1, paranoia frequency (.33), conviction (-3.48), distress (2.42), shame (-3.57), self-criticism (.00), self-reassurance (-3.25), acceptance and avoidance (-6.11), mindfulness observing subscale (-5.23), awareness subscale (7.40), non-judging (7.56). RCIs for P2, paranoia frequency (.66), conviction (-1.05), distress (-1.21), shame (.00), self-criticism (-1.83), self-reassurance (10.14), acceptance and avoidance (.68), mindfulness observing subscale (31.41), awareness subscale (1.48), non-judging (-2.52).	1) Preliminary findings in small case study design, however, improvements across the participants were different 2) CFI did not change the frequency of the psychotic experiences, but did improve conviction and related distress.	1) Small sample size (n = 5) and the lack of a control group means lack of generalisability. 2) 3 out of 5 participants were excluded from results due to not filling in the measures in a 'valid manner'. 3) Lack of follow up measure, therefore it is unknown if changes are longstanding.
Heriot Maitland (2025)	1) Social Safeness 2) Self Compassion 3) Social Comparison	Mixed Effects Models highlighted sig. change when using Bonferroni correction (due to multiple analyses) for social safeness (*r2* = .23, 95% *C.I.* = 3.63, 7.38, *p* < .001, *d* = 0.53) and self-compassion (*r2* = .08, 95% *C.I.* = 1.52, 5.70, *p* = .002, *d* = 0.50). No sig. change was identified for social rank (*r2* = .03, 95% *C.I.* = .0.15, 8.09, *p* < .087, *d* = 0.21), although improvements observed when looking at descriptive statistics.	1) Sig. improvements identified for social safeness and self-compassion only. 2) This six-session intervention could be used alongside other approaches, not designed to be a replacement.	1) Lack of control group means results cannot be definitively contributed to CFI. 2) Lack of follow up measure, therefore it is unknown if changes are longstanding.

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
				3) No recording of participant's previous psychological input.
Hickey (2020)	1) Depression, Anxiety & Stress 2) Self-Criticism 3) Psychosis Symptoms 4) Self-Compassion 5) Mindfulness 6) Sociability	One-way ANOVAs highlighted sig. improvements between pre and post CFI for self-compassion (p = .047, d = .56), depression, anxiety and stress (p = .032, d = -0.75), global functioning, role subscale (p = .000, d = 1.16) and social subscale (p = .000, d = 1.31), psychosis symptoms using BPRS (p = .005, d = -2.07) , RQ pre-occupied subscale (p = .008, d = -0.80) and RQ fearful subscale (p = .017, d = -0.73). One-way ANOVAs highlighted no sig. changes between pre and post CFI for mindfulness (p = .765, d = 0.08), psychosis symptoms using the CAARMS (p = .178, d = -0.38), self-criticism, on inadequate-self subscale (p = .334, d = -0.34), reassuring-self subscale (p = .258, d = -0.31), or hated-self subscale (p = .185, d = -0.37), RQ secure subscale (p = .275, d = 0.30) and RQ dismissing subscale (p = .847, d = -0.06). See Table S5 for follow ups.	1) Sig. improvements were identified in self-compassion, depression, stress and anxiety, global functioning, and two subscales of the RQ only. 2) Sig. improvements were seen for psychosis symptoms on the BPRS, but not the CAARMS. At follow up, both were sig. 3) Some improvements were not seen immediately after the CFI, but were identified at the six week follow up.	1) Lack of control group means results cannot be definitively contributed to CFI. 2) Small sample size (n=17) means limited generalizability. 3) Bias in recruitment, participants furthest away were not referred in
Laithwaite (2009)	1) Depression 2) Self-Esteem 3) Self Compassion 4) Shame	Friedman's analyses identified sig. change from pre and post CFI for social comparison (χ^2 = 8.54 (3), p = .036, r = .30), depression (χ^2 = 10.05 (3), p = .018, r = .38), shame (χ^2 = 8.35 (3), p = .04, r = .04), self-esteem (χ^2 = 12.5(3), p = .006, r = .14), general psychopathology (χ^2 = 7.61 (2), p = .022, r = .38).	1) Significant improvements identified for social comparison, depression, shame, self-esteem and general psychopathology only.	1) Lack of control group means results cannot be definitively contributed to CFI. 2) Small sample size (n=18) means limited generalizability.

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
	5) General Psychopathology 6) Self-Concept 7) Self-Image	Friedman's analyses identified no sig. change from pre and post CFI for self-compassion (χ^2 = 4.87 (3), p = .180, r = .22), self-concept (χ^2 = 1.85 (3), p = .603, r = .01) and self-image (χ^2 = 5.09 (3), p = .165, r = .14), positive symptoms (χ^2 = 2.79 (2), p = .248, r = .10) and negative symptoms (χ^2 = 5.79 (2), p = .055, r = .02). Wilcoxon-Signed Ranks Tests were completed on outcomes with sig. changes. Social comparison (Z=1.96, *n-ties* = 11, p < .05, r = 0.3), depression (Z= 2.33, *n-ties* =15, p <.05, r = 0.38), shame (Z= .801, *n-ties*= 11, p > .5, r = 0.15), depression (Z=2.33, *n-ties* = 15, p < .05, r = 0.38), general psychopathology (Z=2.23, *n-ties* = 14, p <.05, r = 0.38). The paper reports (without statistics) a sig. finding for self-esteem. See Table S5 for follow ups.	2) These improvements were maintained at 6 week follow up. 3) CFIs are feasible interventions for individuals in high security settings experiencing psychosis.	3) The p value was not corrected for the small sample size, therefore, increased chance of Type 1 error. 4) Normative data for psychosis, forensic populations were not available.
Khoury (2013)	1) Social Functioning 2) Emotion Regulation 3) Distress 4) Mindfulness 5) Cognitive Insight 6) Psychotic Symptoms	Although visually scores did decrease for some outcome measures before and after the CFI, one-way ANOVAs identified them to not be significant for any measure, social functioning (p = .548, d = .14), emotion regulation (p = .775, d = 0.07), distress (p = .958, d = -0.01), cognitive insight (p = .230, d = 0.27), psychosis symptoms (p = .156, d = 0.28), depression-anxiety (p = .250, d = 0.32).	1) No sig. improvements were identified for any outcomes immediately after the CFI. 2) Individuals with lower scores of psychotic symptoms experiences sig. less change in relation to symptom severity.	1) Lack of control group means results cannot be definitively contributed to CFI. 2) Small sample size (n=12) means limited generalizability.

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
		Participants who did not show improvements (n = 6), had sig. lower baseline scores than participants who did improve (n = 6), for psychosis symptoms ($t(10)$ = -5.01, p < .005), higher mindfulness ($t(10)$ = 2.84, p <.005) and better social functioning ($t(10)$ = 3.00, p < .005)	3) Changes were more significant at three month follow up in comparison to immediately after CFI (Table S5).	
Rauschenberg (2021)	1) Psychosis Symptoms 2) Depression 3) Anxiety 4) Threat 5) Paranoia	Linear mixed models highlighted the CFI did have sig. effect on psychotic symptoms (β = −.25, 95% *C.I.* =−0.34, −0.16, p < .001) and threat anticipation (β = −.61, 95% *C.I.* =-0.83, −0.39, p < .001). Whilst a sig. effect of the CFI was identified, sig. change between pre and post outcome measures was not found using Wilcoxon Signed-Rank Tests for psychosis symptoms recorded on the BSI (z = -1.02, r = -.32) and PQ (z = -1.32, r = -.42), depression (z = -1.02, r = -.33), or anxiety (z = -1.74, r = -.55). A Wilcoxon Signed-Rank Test found sig. increase in paranoia following the CFI (z = 1.94, r = .61). Whilst this sig. reduced again at follow-up (z = -2.50, r =-.79), there remained no sig. change from baseline (see Table S5).	1) The CFI had a sig. effect on several outcomes, including psychotic symptoms and threat anticipation. 2) Whilst improvements were observed across outcomes, they did not reach statistical sig. 3) Paranoia initially increased following the CFI, however, displayed a sig. decrease from baseline at follow up.	1) Lack of control group means results cannot be definitively contributed to CFI. 2) Small sample size (n=10), largely female, therefore limited generalizability. 3) Data was not collected by an independent researcher, therefore there are potentials for researcher bias.
Martins (2018)	1) Social Functioning 2) Positive Symptoms 3) Negative Symptoms	Wilcoxon signed rank tests highlighted sig. improvements for social functioning (x = -2.07, r = -.65, p = .038), positive symptoms (x = -2.37, r	1) Preliminary support for CFIs in social functioning, positive and	1) Small sample size (n= 10), therefore limited generalizability. This is a

First Author, Year	Outcome Variables	Results	Main Findings	Limitations
	4) Self-Compassion 5) External Shame 6) Fears of Self-Compassion 7) Self-Reassurance	=- -.75, p = .018), negative symptoms (x = -1.97, r = -.62, p = .049), fear of self-compassion (x = -2.14, r = -.68, p = .032), Wilcoxon signed rank tests highlighted non-sig. improvements for self-compassion (x = 1.68, r = -.53, p = .092), external shame (x = -0.91, r = -.29, p = .36), self-reassurance (x = .78, r = .25, p = .438),	negative symptoms of psychosis and fear of compassion only.	subsection of a wider clinical trial which is still taking place. 2) Several additional outcome measures are listed within the methods section but are not reported as results. 3) Lack of control group means results cannot be definitively contributed to CFI. 4) Lack of follow up measure, therefore it is unknown if changes are longstanding.

Note. *m* = mean, sig. = significant. Any abbreviations for outcome measures can be seen in full in Appendix E. Confidence intervals, p values and effect sizes are reported above, if they were reported in the original paper.

Table S5

Results Table for Papers which Included a Follow Up Measure.

First Author, Year	Format of CFI and Population	Point of Follow up	Results when comparing baseline scores and scores at follow up
Heriot-Maitland (2023)	Individual CFI, Clinical Population	Six weeks after the intervention	Wilcoxon Signed-Rank Tests identified sig. improvements for psychosis symptoms (Z = -2.02, p = .043), distress (Z = -2.23, p = .026), dissociation (Z = -1.86 p = .063), self-inadequacy (Z = -2.20, p = .028), self-reassuring (Z = -.426, p = .670), self-hate (Z = -2.20, p = .028), shame (Z = -2.37, p = .018), self-compassion (Z = -2.12, p = .034) and beliefs about illness (Z = -2.37, p = .018). Wilcoxon Signed-Rank Tests identified no sig. changes for depression (Z = -1.86, p = .063), anxiety (Z = -1.15, p = .249), stress (Z = -1.88, p = .061) and social comparison (Z = -1.69, p = .091).
Mayhew (2008)	Individual CFI, Clinical Population	Six months after the intervention	No data analyses were completed, data were presented as histograms for one participant. For general symptomology, a visual decrease from baseline to follow up is present. For self-criticism, all subscales have a visual decrease from baseline apart from inadequate self which increased. For self-compassion, five subscales of the SCS noted visual improvements, two worsened, and one remained the same. Auditory hallucinations increased from the end of the CFI and the follow-up, however, still remained lower than when comparing to baseline.
Forkert (2022)	Individual CFI, Clinical Population	Six weeks after the intervention	Repeated measures ANOVAs highlighted improvements in paranoia (change score 12.90, 95% *C.I.* = 1.22, 27.07, *d*=0.51), self-compassion (change score–0.40, 95% CI–0.71, -0.09, d=–1.10), negative beliefs about self (change score 2.08, 95% *C.I.* = 0.20, 3.97, d=0.44), negative beliefs about others (change score 4.58, 95% CI 2.01, 7.16, *d* =1.30), positive beliefs about the self (change score–2.58, 95% *C.I.* = 4.76,–0.41, *d* = –0.58) and others (change score–1.08,

First Author, Year	Format of CFI and Population	Point of Follow up	Results when comparing baseline scores and scores at follow up
			95% *C.I.* = 3.90, 1.74, *d* = –0.35), self-esteem (change score 3.25, 95% *C.I.* = 0.61, 5.89, *d* = 0.72), and self-comparison (change score–340.44, 95% *C.I.* = 538.16,,–142.72, *d* = –1.11)
DeTore (2023)	Group CFI, Non-Clinical Population	12 months after the intervention	Paired t-tests identified sig. change was maintained for psychotic experiences (*t*(41)= 5.93,*p* <0.001,*d*=−0.92) and distress (*t*(41) = 4.53, *p* <0.001, *d* =−0.71). Paired t-tests identified sig. change was not identified for depression (*t*(41) = -.45, *p* =.66, *d* =−0.07), anxiety (*t*(37) = 1.44, *p* = .16, *d* =−0.23), resilience (*t*(33) = .000, *p* <1.00, *d* =0.01), self-compassion (*t*(35) = -.28, *p* = .78, *d* =−0.05), mindfulness (*t*(33) = -1.50, *p* = .14, *d* = 0.27), empathy (*t*(36) = 1.95, *p* = .06, *d* = −0.32) and positive affect (*t*(37) = .89, *p* =.38, *d* =−0.15). Note. These results were presented to 2 decimal points within the original piece of research.
Hickey (2020)	Group CFI, Clinical Population	6 weeks after the intervention	One-way ANOVAs highlighted sig. improvements for self-compassion (*p* = .007, *d* = 0.80), depression, anxiety and stress (*p* < .001, *d* = -1.40), global functioning, role subscale (*p* = .002, *d* = 1.01) and social subscale (*p* < .001, *d* = 1.56), psychosis symptoms using BPRS (*p* = .003, *d* = -2.196), psychosis symptoms using the CAARMS (*p* = .008, *d* = -0.84), RQ pre-occupied subscale (*p* = .013, *d* = -0.74) and RQ fearful subscale (*p* = .005, *d* = -0.90). self-criticism, on inadequate-self subscale (*p* < .001, *d* = -1.14), hated-self subscale (*p* = .002, *d* = -1.01) One-way ANOVAs highlighted no sig. changes for mindfulness (*p* = .084, *d* = 0.58), self-criticism, on the reassuring-self subscale (*p* = .343, *d* = -0.28), RQ secure subscale (*p* = .201, *d* = 0.36) and RQ dismissing subscale (*p* = .832, *d* = -0.06).

First Author, Year	Format of CFI and Population	Point of Follow up	Results when comparing baseline scores and scores at follow up
Laithwaite (2009)	Group CFI, Clinical Population	6 weeks after the intervention	Wilcoxon-Signed Ranks Tests identified sig. change for social comparison (Z=2.148, *n-ties* =10, p <.050, r = 0.36), depression (Z= −2.825, *n-ties* =16, p <.01, r =0.47) and self-esteem (Z=−2.80, *n-ties* =15, p <.01, r = 0.47). Wilcoxon-Signed Ranks Tests identified no sig. change for shame (Z=.801, *n-ties* = 11, p >.5, r = 0.15). Analyses were not completed for measures which were not sig. at the end of the CFI.
Khoury (2013)	Group CFI, Clinical Population	3 months after the intervention	One-way ANOVAs identified no sig. follow ups for social functioning (p = .985, d = -0.04), emotion regulation total score (p = .060, d = 0.61), distress (p = .905, d = 0.11), cognitive insight (p = .239, d = -0.34), psychosis symptoms (p = .109, d = -0.25), depression-anxiety (p = .082, d = 0.68). One sig. effect was identified for the negative subscale of emotion regulation (p = .007, d = 1.00).
Rauschenberg (2021)	Group CFI, Clinical Population	4 weeks after the intervention	Linear mixed models highlighted the CFI did have sig. effect on psychotic symptoms (βb = −.36, 95% *C.I.* =−.44, −.28, p < .001) and threat anticipation (βb = −.96, 95% *C.I.* =-1.15, −0.76, p < .001). Whilst a sig. effect of the CFI was identified, sig. change between pre and post outcome measures was not found using Wilcoxon Signed-Rank Tests for psychosis symptoms recorded on the BSI (z = -1.17, r = -.37) depression (z = -1.03, r = -.33), anxiety (z = -1.79, r = -.57) or paranoia (-1.74, -.55). A Wilcoxon Signed-Rank Test found sig. improvement in psychosis symptoms on the PQ (z = -2.05, r = -.65).

Note. *m* = mean, sig. = significant. Any abbreviations for outcome measures can be seen in full in Appendix E. Confidence intervals, p values and effect sizes are reported above, if they were reported in the original paper.

Discussion

Discussion of Findings

Benefits of CFIs on Therapeutic Outcomes

All papers included in the review supported the use of CFIs for individuals experiencing psychosis, concluding that CFIs are beneficial, feasible and helpful interventions for improving therapeutic outcomes within this population. When looking at results across the papers, improvements were identified in at least 50% of the outcomes utilized in each paper, with some papers reporting improvements in 100% of included outcomes (Brown, 2021; Fokert et al., 2022; Mayhew & Gilbert, 2008).

Despite this, depression is the only outcome in which significant change is consistently observed across all papers. For all other outcome measures, inconsistent results were observed when looking across the papers. For example, when looking at self-compassion, eight papers identified change following the CFI (Brown, 2021; Burke et al., 2020; DeTore et al., 2023; Fokert et al., 2022; Heriot-Maitland et al., 2023; Heriot-Maitland et al., 2025; Hickey et al., 2020; Mayhew & Gilbert, 2008), whereas three papers did not (Ascone et al., 2017; Laithwaite et al., 2009; Martins et al., 2018).

Similarly, when looking at anxiety, six papers identified an improvement in levels of anxiety following the CFI (Burke et al., 2020; Cheli et al., 2020; DeTore et al., 2023; Hickey et al., 2020; Mayhew & Gilbert, 2008; Rivera et al., 2023), whereas two papers did not (Heriot-Maitland et al., 2023; Rauschenberg er al., 2021). Whilst these conflicting findings may indicate CFIs do not reliably lead to significant therapeutic change for all therapeutic outcomes within this population, it is also possible that methodological differences across the papers may contribute to the differences observed.

Differences between the CFIs

One possible explanation for the differences observed between therapeutic outcomes across the studies, is the difference in focus and format of the intervention. This is highlighted in Table S1, with CFIs ranging in length, frequency, facilitator and the use of homework. Additionally, several of

the CFIs were integrated with other psychological approaches, such as mindfulness, mentalization and acceptance. Whilst integrative approaches were included in the review to provide the richest narrative possible for CFIs in these populations, the focus of the integrative interventions varied across the studies. These different focuses may explain why inconsistent findings were identified across the studies. Additionally, it cannot be definitively stated that it was the CFI component of these interventions that led to the improvements observed across therapeutic outcomes. With previous research finding support for the use of approaches such as mindfulness (Hodann-Caudevilla et al., 2020) and mentalization (Lana et al., 2015), it is possible that these components were responsible for clinical change.

It is important to acknowledge the potential influence of unmeasured variables beyond the content of the CFI intervention that may have contributed to the therapeutic changes observed, such as the rapport with the facilitator (Kumpasoğlu et al., 2025) and group cohesion (Burlingame et al., 2018). Many studies were unable to explore these factors due to the absence of a control group or failed to acknowledge them as alternative explanations for their findings. Findings from Ascone et al. (2017) appear to support this, identifying significant improvements in both the CFI and control groups, with no significant group effect. This suggests that group-related processes, independent of the compassion-focused content, may have played a role in improving therapeutic outcomes.

Differences in Outcome Measures

When looking at the different findings across the papers, a further explanation for the inconsistencies across findings may be identified when looking at the number of different outcome measures utilized. With 59 different tools used across all studies, varying in length and method of delivery, it is likely that clinical presentations were captured in differently across the papers. For example, some measures of psychosis utilized self-report questionnaires, whereas others relied on clinician-ratings following semi-structured interviews. Outcome measures which rely on clinician-rated scores can be helpful, given that individuals experiencing psychosis may lack insight into their experiences (David, 1990); find filling out questionnaires difficult (Sawada et al., 2024); and may

therefore provide inaccurate answers about their objective clinical presentation. Whilst one study acknowledged these difficulties and supported participants to complete outcome measures, 60% of the sample were recorded as not completing the measures in a 'valid' manner and were excluded from the data analyses, therefore increasing the risk of bias for the overall findings of this study regardless (Martins et al., 2017).

Whilst clinician-rated measures may help to mitigate these risks, special considerations should be made to methodological design to minimize the risk of potential bias. For example, the clinician scoring the measure should be blind to group allocation in randomized controlled studies and should always be independent to the delivery of the CFI. These were considered within the methodological design of several papers included in the review, increasing the reliability of their findings (Braehler et al., 2013; Hickey et al., 2020; Khoury et al., 2013). Two papers did not account for this increased risk of bias, with clinician-rated items administered by the lead developer of CFT (Heriot-Maitland et al., 2023), or by clinicians who delivered the CFI (Rauschenberg et al., 2021). With a possible increased risk of Type One errors, the potential researcher bias should be considered when interpreting these results. Although timely and costly, it may be most appropriate for future research to include both clinician-rated and participant-rated measures to ensure experiences are captured in an accurate and reliable manner (Young et al., 2011).

Differences in Data Handling and Interpretation

A final methodological aspect to consider when interpreting the results, is how the data were analysed and interpreted. Whilst some papers utilized large samples which were sufficiently powered for statistical analyses, others completed statistical analyses on small samples (Fokert et al., 2022) and accepted an increased risk of type-one errors (Laithwaite et al., 2009). Additionally, one paper presented results in histogram format only and did not complete statistical analyses (Mayhew & Gilbert, 2008). Whilst this is a helpful contribution to the existing literature base in highlighting potential therapeutic change following a CFI, these findings should be interpreted tentatively. This is

because without statistical analyses supporting these findings, the true size of these effects cannot be determined.

Other papers included descriptive statistics in addition to statistical analyses. They highlighted that whilst improvements were observed upon visual inspection of the data, they were not statistically significant following analyses (Khoury et al., 2013, Heriot-Maitland et al., 2025, Rauschenberg et al., 2021). With differences in data handling and interpretation identified across the papers, it is important to consider the strength and certainty of findings when comparing conflicting results.

Other Considerations

Symptoms of Psychosis in Clinical vs. Non-Clinical Samples

When looking at the effect of CFIs on positive symptoms of psychosis, a key difference was identified when comparing clinical and non-clinical samples. In non-clinical samples, a significant decrease in psychosis symptoms was identified following the CFI in all papers (Brown, 2021; Burke et al., 2020; DeTore et al., 2023; Lincoln et al., 2013). However, results across clinical samples were conflicting, with both significant (Ascone et al., 2017; Fokert et al., 2022; Heriot-Maitland et al., 2023; Martins et al., 2018; Rauschenberg et al., 2021) and non-significant changes observed (Hickey et al., 2020; Khoury et al., 2013; Laithwaite et al., 2009; Martins et al., 2017).

It is possible that methodological differences across the papers contributed to these inconsistencies, as previously discussed. This includes the use of different outcome tools measuring symptoms of psychosis, statistical analyses and CFI format. Alternatively, the inconsistencies within clinical samples may suggest that CFIs are not universally able to reduce psychosis symptom severity. Given the diverse clinical presentations of psychosis, this variability is perhaps to be expected, and some individuals do not experience an improvement within this area despite ongoing alternative treatments to CFIs. These findings are in line with research trialling CBT, with only 50-60% of individuals experiencing a reduction in psychosis symptoms (Gould et al., 2001), despite CBT being a first-line treatment for psychosis recommended by NICE guidelines (NICE, 2025b).

Regardless of the contributive factors behind these inconsistencies, it is important to note that reducing the severity or frequency of psychosis symptoms is often not the aim of CFIs. Instead, the aim of CFIs is often to identify 'underlying psychological processes', such as distress and beliefs about the self, to support individuals to relate differently to the symptoms when they do arise (Cuppage et al., 2018). Findings across some of the papers supported this, highlighting that whilst the frequency of symptoms did not change, voices became less malevolent (Mayhew & Gilbert, 2008), delusional conviction decreased (Martins et al., 2017), and participants were less distressed by their symptoms (DeTore et al., 2023; Heriot-Maitland et al., 2023). With this in mind, the benefits of CFIs for psychosis should not be evaluated solely on symptom reduction, but through the consideration of wider therapeutic outcomes.

Use of Follow-Up Measures

Eight papers within the review utilized follow-up measures ranging from four weeks to nine months following the CFI. Across the eight papers, inconsistencies were identified in relation to which outcomes had maintained change and which had not. For example, improvements in psychosis symptoms were identified at follow-up in three papers (Heriot-Maitland et al., 2023; DeTore et al., 2023; Hickey et al., 2020), but not in two papers (Khoury et al., 2013; Rauschenberg et al., 2021). For distress, significant improvements were identified in two papers at the point of follow up (DeTore et al., 2023; Heriot-Maitland et al., 2023) but not by Khoury et al., (2013). These inconsistencies are perhaps in line with the inconsistencies across papers, with methodological differences which may be contribute to these inconsistencies already discussed.

Across the papers, delayed improvements were identified for self-compassion, depression, emotion regulation and distress (Heriot-Maitland et al. 2023; Hickey et al., 2021; Khoury et al., 2015). These outcome measures displayed no significant change immediately after the CFI and therapeutic improvement was identified by the follow-up measure only. This indicates that the true benefits of the CFIs may not be observable for all outcomes immediately at the end of the intervention, but rather that therapeutic change may increase over several weeks.

With only eight papers utilizing follow-up measures, it is possible that the true benefits of the CFIs were not identified across the remaining ten papers. Whilst some studies noted that follow-ups were unfeasible due to a lack of resources (Heriot-Maitland et al., 2025), or difficult to implement due to a large attrition rate at the point of follow-up (DeTore et al., 2023), efforts should be made to incorporate longitudinal designs in future research where possible.

Lack of Control Groups

Across the 18 papers included in the review, only four papers included a control group (Ascone et al., 2017; Braehler et al., 2013; ; Brown et al., 2021; Lincoln et al, 2013). Whilst the presence or absence of a control group were not considered within the quality assessment of the papers, as per the CCAT guidelines, it is important to consider the lack of control groups within the interpretation of findings. This is because without a control group, it is difficult to ascertain whether the CFT itself was responsible for the benefits observed across the papers, or whether extraneous variables may have influenced results. The lack of a control group was listed as a limitation across many of the remaining papers, making this a strong recommendation for future research.

Imagery Techniques

A final consideration for the implementation of CFIs for this population, is the role of imagery. Whilst previous research has identified imagery as a helpful therapeutic technique for individuals experiencing psychosis (Elgit et al., 2020), this was only supported by one paper in the review (Ascone et al., 2017). Other papers highlighted participants' difficulties in conjuring images (Laithwaite et al., 2009), preferring to imagine somebody from their past instead of imaginary people, such as an ex-psychiatrist (Mayhew & Gilbert, 2008). Others described the imagery tasks as 'effortful yet rewarding' (Fokert et al., 2022), or easy when basing their images on people they knew (Brown, 2021). With only 50% of participants rating themselves as 'very successfully' able to complete the

imagery tasks on a one-to-seven Likert scale (Rauschenberg et al. 2021), the ability to conduct imagery appears to differ between individuals within this population.

Whilst it is unknown if the difficulties in completing imagery tasks adversely affected therapeutic outcomes, it is important for CFI facilitators to be aware of these experiences when planning interventions for individuals experiencing psychosis. Adaptations to the delivery of imagery work for this demographic have been identified in previous research, including allowing participants to keep their eyes open and look at a fixed point in the room (Taylor et al., 2019). Given the high prominence of imagery techniques used within the CFIs included in this review, it may be helpful for CFI facilitators to explore an individual's ability to complete imagery tasks before delivering these interventions.

Strengths

One strength of the current review is its clinical relevance for facilitators planning CFIs. The paper provided a comprehensive synthesis of findings for both individual and group CFIs, highlighting the benefits of the interventions, along with specific details of existing CFIs including group length and facilitator.

A further strength of the review is the robustness of the chosen methodological design to increase validity and reliability. Firstly, the paper was pre-registered via PROSPERO and followed several scientific frameworks throughout the design and write up of the report, including PICOS, PRISMA and SWiM. Next, the paper used an appropriate quality assessment tool which measured each paper on its own methodological approach rather than a gold standard methodological design. This was an important factor when considering the differences in methodological designs. Finally, the paper included a second reviewer throughout the title and abstract screening and quality assessments. The second reviewer was blind to decisions made by the first author to help mitigate potential biases throughout the screening and quality assessment processes.

Limitations

One weakness of the current review is its lack of meta-analysis. Whilst conducting meta-analyses would provide more robust conclusions about synthesized data, it was deemed not to be appropriate due to the lack of comparability across the studies. The included studies varied across the specificities of the CFI, the outcome measures chosen, the frequency of data collection and the use of follow ups, and participant demographics. This heterogeneity would prevent the effective use of meta-analysis and potentially render any results as inaccurate.

Finally, whilst the paper has identified benefits across a number of different CFI formats, it was unable to compare data across studies to confirm whether one format has more clinical benefit than others. This was due to the varied statistical analyses completed across the studies, or the sole use of descriptive statistics without analyses. Whilst this was predetermined within the inclusion criteria to allow a comprehensive narrative with high clinical relevance, comparisons across studies were not possible from the data available.

Clinical Implications

This paper has high clinical relevance within the area, highlighting the benefits of both group and individual CFIs, from even brief interventions of one to four sessions. Whilst these short interventions may be seen as an addition to a longer-term treatment plan rather than standalone treatments (Cheli et al., 2020), there is evidence which suggests therapeutic benefits can be observed in a relatively short amount of time. With a four-week CFI identified as an effective 'waiting-list' intervention (DeTore et al., 2023), services may wish to consider implementing a short CFI for individuals waiting for longer term therapy. Given the increased demand for mental health services in recent years (Byrne et al., 2021), this may be a helpful way to manage long waiting lists and prevent deterioration in symptoms whilst awaiting treatment.

The paper has also highlighted the benefits of using a CFI for individuals experiencing psychosis on a range of different outcomes, including depression, distress and anxiety. This is useful

for clinicians working in this area, with one intervention having the potential to benefit several aspects of an individual's presentation. Despite this, several of the papers also identified CFIs did not directly improve the frequency or severity of the psychotic symptoms themselves. Whilst this has been explored in the context of methodological design of the papers, this remains important for clinicians planning interventions for individuals with psychosis. It is possible that CFIs are most appropriate for clients who are either 1) do not wish to directly prioritize symptom reduction as a treatment goal, or 2) are experiencing severe positive symptoms.

Applying findings identified within this review, there is an argument for the implementation of early, preventative psychological interventions, such as CFIs, within non-clinical samples. This is due to the finding that psychosis symptomology significantly reduced following the CFIs within all papers recruiting these samples. When considering symptoms of psychosis within non-clinical populations significantly predict later clinical presentations of psychosis (Kaymaz et al., 2012), and that early and effective treatment of psychosis symptoms prevents a worsening in symptomology (Stafford et al, 2013), interventions which can be implemented as preventative measures are of great interest. Whilst there were only four studies which utilized non-clinical samples, all found support for the idea that CFIs significantly reduce symptoms of psychosis and indicate the potential utility of providing CFIs to this population.

Recommendations for Future Research

Whilst findings support the utility of CFIs in samples experiencing psychotic symptoms, many studies were preliminary with small sample sizes. Across the current literature base, there is a call for future research to 1) recruit larger samples, 2) utilize control groups, and 3) implement longitudinal designs with follow-up measures. The delayed therapeutic change identified by studies using a follow up time point emphasizes the potential risk of missing treatment effects if measurements cease too soon.

Future research may also wish to consider testing psychometric properties of outcome measures relating to self-compassion in clinical samples experiencing psychosis. To the authors

knowledge, this has not yet been completed on outcome measures listed in the current review. With a rise in research in recent years investigating CFIs in these populations, it is important that accurate, reliable therapeutic change is captured when evaluating these interventions.

Next, future research should aspire to report all aspects of methodological design in a clear, comprehensive manner. The quality assessments completed within the current review highlighted a lack of clarity within the existing research in some areas of methodological design, particularly across sampling methods. Omitting this information from clinical research increases the risk of bias, reduces comparability across samples and makes it difficult to apply clinical implications. Future research which provides sufficient detail across their methodological sections, including the rationale for their decisions, will reduce the risk of bias and increase replicability of research within this area.

Finally, future research should look at the effectiveness of CFI without the integration of secondary psychological approaches. With many of the papers highlighting the utility of CFI alongside other approaches, it is difficult to ascertain whether the therapeutic benefits observed are due to the part of the intervention relating to compassion. Whilst these findings are helpful in the current understanding of CFIs and how they can be used alongside other approaches, a more detailed understanding of the specific role of CFIs are called for.

Conclusions

In conclusion, findings from the existing literature are largely in support of CFIs for psychosis in both clinical and non-clinical samples. Therapeutic benefit was observed in a range of different therapeutic outcomes although these differed between each study. The inconsistent findings may be due to differences in methodological design across the papers, discussed above. Additionally, differences in the interventions themselves may have contributed to these findings, with the review including both individual and group interventions which were integrative with other psychological approaches. Whilst papers included in the review all supported the use of CFIs within this area, many of the studies were preliminary, feasibility studies or utilized case series designs. Future research is

therefore called for within this area, recruiting larger samples, including follow-up measures, and implementing control groups.

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Investigating the Mediating Role of Cognitive Theory of Mind in the Relationship between Developmental Trauma and Paranoia: A Cross-Sectional Study in a Non-Clinical Population

Investigating the Mediating Role of Cognitive Theory of Mind in the Relationship between Developmental Trauma and Paranoia: A Cross-Sectional Study in a Non-Clinical Population

Abstract

The current paper recruited a non-clinical sample to explore whether, 1) developmental trauma predicted Cognitive Theory of Mind (CToM) ability, and 2) CToM mediated the relationship between developmental trauma and paranoia whilst controlling for self-compassion. The study utilized a cross-sectional design, with participants completing measures online via an anonymous link. Whilst 145 participants were recruited to take part in the study, only 91 participants completed all measures (including the R-GPTS, CATS, S-SCQ and IMT) and were included in the final data analyses. Linear regressions highlighted that developmental trauma did not predict CToM ability overall, however, the neglect subscale of the CATS significantly predicted lower CToM ability. A mediation analysis found that CToM did not mediate the relationship between developmental trauma and paranoia when controlling for self-compassion. Whilst findings of the main research questions were non-significant, potential methodological issues were identified and recommendations for future research discussed. Strengths of the paper included the adaptation of methodological design following recommendations from previous research and the use of a pilot study. Limitations included a high attrition rate and limited generalizability due to a predominantly White, female sample.

Keywords:

Cognitive Theory of Mind, Developmental Trauma, Paranoia, Mediation

Introduction

Developmental trauma refers to the impact of adverse childhood experiences on both psychological and physiological states (Lyons et al., 2020). Developmental trauma can occur during childhood or adolescence and includes experiences such as neglect or abuse (Min et al., 2007), bullying (Nielsen et al., 2015) or displacement (Bürgin et al., 2022). Whilst protective factors may mitigate the impact of developmental trauma (Racine et al., 2020), long-lasting difficulties associated with developmental trauma have been identified, including difficulties with relationships (Huh et al., 2014), low self-esteem (Downey & Crummy, 2022) and psychosis (Larkin & Read, 2008).

Psychosis is an umbrella term used to describe an individual's experiences which are not shared by the world around them (Parnas et al., 2010). Whilst the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V) categorizes symptoms of psychosis with mental health diagnoses such as schizophrenia (DSM-V, 2013), experiences of psychosis are now understood to lie on a continuum and can therefore be experienced outside of formal diagnoses (Baumeister et al., 2017; van Os, 2003). Findings from a cross-sectional study support the continuum hypothesis, highlighting 12.5% of participants recruited from the general population reported at least one symptom of psychosis (Nuevo et al., 2012). Whilst this study was completed over ten years ago, it remains useful in representing the presence of psychosis in the general population, identifying prevalence rates ranging from 0.8% to 31.4% across 52 countries. With the prevalence of psychosis related diagnoses increasing since that research was completed (Solmi et al., 2023), it is possible that the current prevalence rates of psychosis may be significantly higher.

The association between developmental trauma and psychosis has been extensively documented (Bailey et al., 2018; Giannopoulou et al., 2023; Kilcommons & Morrison, 2005) and can be observed in both clinical (Read et al., 2005), and non-clinical populations (Toutountzidis et al., 2022). Support for this relationship has been identified when exploring the association between developmental trauma and several specific symptoms of psychosis, including paranoia (Gracie et al., 2007), persecutory delusions (Dickson et al., 2016) and hallucinations (Read et al., 2005).

Additionally, when comparing psychotic and non-psychotic samples, individuals who experienced developmental trauma were identified as more likely experience psychosis (Varese et al., 2012).

Whilst the relationship between developmental trauma and psychosis has been well documented, exploration of the nature of this relationship continues. One theory suggests that brain changes following developmental trauma are responsible for the association, with structural changes to the hippocampus and an increased production of dopamine and serotonin identified in populations who have experienced developmental trauma (Read et al., 2001). Authors argued that this 'traumagenic neurodevelopmental model' best explains several symptoms of psychosis, such as dissociation and cognitive impairment, which are often associated with the identified neuroanatomical differences. Whilst this is a helpful theory, it fails to acknowledge the impact of cognitive processes, such as the maintenance of negative appraisals surrounding oneself or the world, which increase the likelihood of developing psychosis following traumatic experiences (Kilcommons & Morrison, 2005). With support for both models identified, a biopsychosocial model which accounts for biological predispositions, social context and individual differences may be most appropriate in explaining the relationship between developmental trauma and psychosis (Barker et al., 2015; Garety et al., 2000).

Whilst these theories may at least partially explain the relationship between developmental trauma and psychosis, research is now exploring potential mediators responsible for this association. Initial findings have suggested that several different mechanisms may mediate the relationship between developmental trauma and psychosis, including self-compassion (Richardson et al., 2023). Self-compassion can be defined as the ability to recognize one's own pain and suffering, whilst showing continued kindness and understanding towards oneself through these experiences (Barnard & Curry, 2011). Whilst self-compassion is not listed as a diagnostic criterion for any mental health diagnoses (DSM-V), research has highlighted that individuals who experience mental health difficulties often display low levels of self-compassion (Athanasakou et al., 2020). This finding is supported by research looking at the relationship between self-compassion and psychosis (Scheunemann et al., 2019) and developmental trauma (Winders et al., 2020). With self-compassion identified as a significant mediator in this relationship, results suggested that developmental trauma

predicted low levels of self-compassion, which in turn predicted symptoms of psychosis (Richardson er al., 2023).

To continue developing the current understanding of this relationship, research continues to explore alternative mediators including Theory of Mind (ToM). ToM refers to the ability to understand the thoughts, feelings and intentions of others (Schlinger, 2009), a transdiagnostic process (Braak et al., 2022) which usually starts to develop at the age of four years old (Wellman et al., 2001). In the context of the current area, ToM is an interesting mediator to explore due to its existing associations with developmental trauma (Germine et al., 2015; Nazarov et al, 2014) and psychosis (Berry et al., 2015; Langdon et al., 2005; Turner et al, 2022).

When focusing on the relationship with developmental trauma, research has highlighted that higher deficits in ToM ability were observed within participants who had experienced trauma in comparison to those who had not (O'Reilly & Peterson, 2015). The most significant deficits were observed in participants who had experienced neglect (Cicchetti et al, 2000), an interesting finding when considering the experience of neglect and how it differs from other types of developmental trauma. Whilst some traumas are defined by the presence of experiences, such as punishment, neglect is defined by the continued absence of care which prevents a child's needs from being met (Dubowitz et al., 1993). It is possible, that this absence of care affects how the individual sees themselves in relation to the world, which in turn influences their ability to interpret the internal experiences of others (Russo et al., 2015; Schalinski et al, 2018).

When focusing on the relationship with psychosis, deficits in ToM have been associated with experiences of psychosis in both clinical (Bora et al., 2009) and non-clinical samples (Bora & Pantelis, 2013). Theory suggests that impaired ToM prevents the understanding of the thoughts and intentions of others, allowing alternative mental states to be attributed to others through a process coined 'overmentalization' (Abu-Akel, 1999; Frith, 2004). Overmentalization can lead to the incorrect interpretation of the mental states of others, which increases the likelihood of psychotic experiences, such as paranoia (Brüne, 2005, Green et al., 2015). This theory is supported by research using clinical samples diagnosed with paranoid schizophrenia, which identified positive symptoms of psychosis was

significantly associated with overmentalization (Montag et al., 2011). With both theoretical and clinical support relating to the existing relationships between ToM, developmental trauma and experiences of psychosis, there is a call for future research to continue developing the understanding of the mechanisms behind these relationships.

Existing research looking at the mediating role of ToM between developmental trauma and psychosis has highlighted conflicting results. Whilst some findings support the theory that ToM significantly mediated the relationship, particularly when focusing on negative symptoms of psychosis in male participants (Mansueto et al., 2019), other findings did not find ToM to have a significant mediating role (Monastra et al.; 2018). Other research highlighted partial mediation, with significant findings only prevalent when looking at only positive symptoms of psychosis (Nonweiler et al., 2023) or specifically in samples with high levels of trauma (Weijers et al., 2018).

One potential explanation for the inconsistent results is the difference in sample characteristics within these studies, including the use of both clinical and non-clinical samples. However, when controlling for these sample demographics, conflicting results continue to be observed when comparing findings within clinical samples (Mansueto et al., 2019; Weijers et al., 2018) and non-clinical samples (Nonweiler et al., 2023; Monastra et al.; 2018). A further explanation for the conflicting results may be provided when looking at the differences in methodological design across the studies. For example, several of the studies utilized standardized measures of ToM, such as The Hinting Task (Mansueto et al., 2019; Weijers et al., 2018), or The Reading the Mind in the Eyes Test (Monastra, 2018), which include task-based approaches to capture ToM ability. Other research used a self-report measure to capture the 'mentalization of others' instead of a standardized task (Nonweiler et al., 2023). It can be argued that self-report measures are perhaps less accurate than standardized tasks at capturing ToM ability, with the potential for individuals to lack insight into their misinterpretation of the thoughts and feelings of others (Stewart et al., 2010) and unintentionally provide inaccurate answers. With potential methodological differences responsible for the conflicting findings, recommendations to help standardise future research were discussed to identify more accurate and reliable findings (Monastra, 2018).

The first recommendation related to how variables are defined and captured, particularly when using umbrella terms such as psychosis. With the term psychosis encompassing a number of different symptoms, measures which capture the broad experiences of psychosis may miss subtle differences in symptom severity and inaccurately represent the participant's experiences (Monastra, 2018). For example, high scores in one area of psychosis (e.g. paranoia) may be counteracted by low scores in another area (e.g. hallucinations), producing a lower overall score than if paranoia had been used as a variable in itself. Acknowledging many individuals experience only a few symptoms of psychosis (Johns et al., 2004), it can be argued that broad measures do not capture data which is sensitive to the variance in symptom severity across different symptoms. Refining the term psychosis and utilizing symptom specific measures may allow for a more nuanced understanding of these relationships to be identified within future research.

With the intention of improving sensitivity within the data analyses, the current paper chose to focus specifically on paranoia. Paranoia was chosen over other symptoms of psychosis for several reasons. Firstly, paranoia has a higher prevalence within non-clinical samples in comparison to other symptoms of psychosis, such as hallucinations (Verdoux & van Os, 2002). Given the current paper aimed to recruit from a non-clinical sample, it was hoped that a wider range of answers would be collected by focusing on paranoia. Secondly, paranoia can be understood as a mistrust or worry about the intentions of others, with individuals commonly fearing other people intend to harm or conspire against them (Freeman & Loe, 2023). Understanding this cognitive element of paranoia, along with its existing relationships to developmental trauma (Carmichael, 2019), this appeared a logical choice for the current paper to investigate alongside ToM which broadly refers to the ability to understand the thoughts and intentions of others.

The current paper also chose to refine the term ToM in line with previous recommendations (Monastra, 2018). Whilst the generic term ToM is often utilized within research, it is understood that ToM consists of two separate components, Cognitive Theory of Mind (CToM) and Affective Theory of Mind (AToM). CToM relates specifically to the understanding of the thoughts and intentions of others, whilst AToM relates specifically to the understanding of the emotional states of others (Raimo

et al., 2022). Whilst much research does not distinguish between the two concepts, there is support that CToM and AToM have different neural pathways (Kanske et al. 2015; Lantos et al, 2023; Schlaffke et al., 2015; Sebastian et al., 2012), and that individuals do perform differently on AToM and CToM tasks (Montag et al., 2011; Shamay-Tsoory et al., 2007).

Whilst there is an argument for measures of ToM to include both AToM and CToM components to allow an accurate overall ToM ability to be identified (Yeh et al., 2021), these measures may partially contribute to the inconclusive findings previously identified should they not report them as separate constructs. When considering the above, the current paper chose to focus solely on CToM. Acknowledging the existing association between CToM and positive symptoms of psychosis (Mehl et al., 2010; Montag et al., 2011), CToM appeared a logical focus of the study alongside paranoia which has been defined as a positive symptom of psychosis (NICE, 2025).

Finally, acknowledging that previous research identified alternative mediators to CToM, the current paper included self-compassion as a control variable within the mediation analysis. This was with the aim of reducing the chance of a false-positive errors and thereby increase the validity that any relationships captured could be associated to ToM. Whilst dissociation has also been identified as a significant mediator between developmental trauma and psychosis (Bloomfield et al., 2021), dissociation is seen more commonly in clinical samples (Calciu et al., 2024). Given the non-clinical sample for the current study, self-compassion was identified as the more appropriate control variable due to its variance outside of clinical presentations (Raes et al., 2011).

In conclusion, considering the existing literature and the recommendations discussed above, the current paper aimed to explore two distinct research questions using a non-clinical sample. Firstly, ‘does developmental trauma predict poor CToM ability?’ and secondly, ‘does CToM mediate the relationship between developmental trauma and paranoia?’ It was hypothesized that experiences of developmental trauma would significantly predict lower CToM ability, and that poor CToM ability would significantly mediate the relationship between developmental trauma and subclinical paranoia.

Materials and Methods

Design

The study used a cross-sectional design, with participants completing measures via an anonymous link using computer software Qualtrics.

For research question one, developmental trauma was the predictor variable and CToM was the outcome variable. For research question two, developmental trauma was the predictor variable, paranoia was the outcome variable, CToM was the mediating variable, and self-compassion was the control variable.

Participants

Participants were 18-65 years of age, fluent in the English language and required access to the internet. Participants were excluded from the study if they did not speak fluent English, had an acquired brain injury, were addicted to illicit drugs or alcohol or had a mental health diagnosis relating to paranoia or psychosis. Participants were asked to confirm their eligibility to each of the inclusion and exclusion criterions and to self-exclude if required.

A voluntary sample of participants were recruited via social media, reddit and SONA (a student recruitment software). Posters were also placed around a university campus and areas of a local community, attached in Appendix I. A G-Power analysis determined 89 participants as a sufficient sample size for the proposed design and analyses, with a moderate effect size ($f^2 = .15$) and 95% power, attached in Appendix J. 92 participants completed the full study and were included in the final analyses; demographics are documented in Table E1 below.

Table E1

Participant Demographics (n = 92)

	n	%
Gender		
Female	68	73.91
Male	24	26.09
Other/ Prefer not to say	0	0
Ethnicity		
White	79	85.87
Asian/ Asian British	2	2.17
Black/ Black British	9	9.78
Mixed/ Multiple Ethnic Groups	2	2.17
Other/ Prefer not to say	0	
Employment Status		
Employed	68	73.91
Unemployed	8	8.70
Student	16	17.40
Prefer not to say	0	0
Type of Device used during Participation		
Handheld	69	75
Desktop	23	25

Note. Age (m = 33.58, range = 18 – 60)

Methodology

Participants read an information sheet, provided consent to participate and confirmed they were eligible to participate based on the study inclusion and exclusion criteria. Demographic information was recorded, including age, gender, ethnicity, and employment status. Measures were then presented to participants in the same order in which they are documented below. All questions were mandatory for completion with the exception of the trauma questionnaire, which for ethical reasons and the minimisation of potential discomfort and distress, allowed participants to miss any items for which they did not wish to provide an answer. To preserve the anonymity of responses, participants were made aware that once submitted, their answers could not be identified and removed from the data set.

Following completion of the study, a written debrief was provided which included signposting to relevant support organizations, see Appendix H. These services were also listed at the start of the study and following the measure of developmental trauma in case participation was terminated midway.

A separate link was offered to participants at the end of the study to enter a prize draw to win one of six £50 Amazon vouchers. This was optional and participants could end the study without giving contact details should they wish. Contact details provided in the prize draw were stored separately to the main data to maintain anonymity. The prize draw was completed after the completion of data collection and all contact details were deleted once winners had been contacted. Participants who were students at The University of Southampton were also provided 12 SONA points which can be used to support with recruitment in their own research.

Ethical approval was provided by The University of Southampton's ethics committee, relevant forms are included in Appendix F. The study was also pre-registered via the Open Science Framework prior to data collection.

Measures

Revised Green et al., Paranoid Thoughts Scale (R-GPTS), (Freeman et al., 2021)

The R-GPTS is an 18-item measure which measures the frequency of paranoid thoughts using a five-point Likert scale. The R-GPTS consists of two subscales, ideas of reference and persecution, with total scores of 32 and 40 respectively (total score of 72). Total scores of 14 or below are considered 'average' within the general population, with higher scores representing higher levels of paranoia. The R-GPTS has a good score of reliability (a = .90) (Freeman et al., 2021) and was identified as the most valid measure of paranoia within non-clinical populations in a recent systematic review (Statham et al., 2019). A copy of the R-GPTS has been attached in Appendix K.

The Child Abuse and Trauma Scale (CATS), (Sanders & Becker-Lausen, 1995)

The CATS is a 38-item measure which screens for the subjective perception of adverse childhood experiences using a five-point Likert scale. The CATS consists of three different subscales (negative home atmosphere/neglect, sexual abuse and punishment), which contribute to a maximum score of 152. Whilst the CATS does not provide indications for clinical cut offs, higher scores represent higher subjective perception of trauma. The total CATS has been found to have both good reliability (a = .90) and validity (r = .89, p < .001) within non-clinical populations (Sanders & Becker-Lausen, 1995).

The subjective nature of the CATS was beneficial to the study design due to its focus on the appraisal of the traumatic experience rather than the presence of the experience itself. With relatively low levels of trauma anticipated within the non-clinical sample, it was hoped that a subjective measure such as the CATS would allow a wide range of answers to be captured and a more sensitive analysis to be completed. Additionally, it addresses recommendations from previous literature that measures should capture the frequency of the traumatic experiences (Peterson et al., 2024). With previous research using only the number of different traumatic experiences to capture trauma severity

(Kilcommons & Morrison, 2005), the CATS allows a more nuanced approach to measuring developmental trauma. A copy of the CATS has been attached in Appendix L.

Self-Compassion Scale-Short Form (SCS-SF), (Raes et al., 2011)

The SCS-SF is a 12-item scale which screens for current levels of self-compassion using a five-point Likert scale. The total score for the SCS-SF is 60, with higher scores indicating higher levels of self-compassion. The SCS-SF is a reliable measure of self-compassion with non-clinical samples (a = .83) and has a near perfect correlation to the full survey ($r \geq 0.97$), (Raes et al., 2011). The short nature of the SCS-SF was identified as a beneficial for the current study to minimize participant burden, given the lengthy nature of some of the other measures. A copy of the SCS-SF has been attached in Appendix M.

The Imposing Memory Task (IMT) (Updated), (Kinderman et al., 1998)

The IMT is a 99-item measure which assesses cognitive CToM ability. Participants are required to read five short stories and answer true or false questions about the content of each story. Half of the questions are related to CToM and ask about the thoughts and intentions of the characters within the story, whilst the others are related to the factual events of the story. The IMT was designed to measure CToM in a non-clinical, adult sample. With many other CToM measures aimed at assessing deficits in ToM at clinical levels, there was a chance that ceiling effects would influence results should the task not be challenging enough for the intended sample (Dodell-Feder et al., 2013).

During the task, participants read one story at a time and could not move onto the questions until a 90 second timer had passed. Once participants had moved onto the questions, they were unable to return to the story. Reminders were placed at the end of each story to ensure participants did not move on until they felt confident that they understood the story. Whilst participants read each story, a sound clip of the story being read aloud played automatically to increase replicability of how the IMT was originally administered by the Kinderman et al. (1998). Sound checks were implemented at the

start of the measure and midway through to ensure participants sound was working, and asked participants to type the word they could hear (which were 'cat' and 'hand').

Whilst the current study aimed to use the IMT as it was originally designed in a methodological way, some adaptations were made to the measure's content. Firstly, the factual questions were reduced by 50%, leaving five factual questions per story and a total of 74 items. This was in response to feedback provided in the pilot study (detailed below) about the length of the task, and considering the potential burden on participants when completing the study. The factual questions were not required for the main analyses and were included only to ensure participants had a good understanding of the story content. Factual questions were included for potential exploratory post-hoc analyses exploring whether any low scores on the ToM subscale were in relation to a lack of overall comprehension rather than ToM ability.

Next, the content of the stories within the IMT was adapted to include information that was more up to date and culturally sensitive. For example, story one originally referenced a car tax disk. In the current study, this was updated to reference a parking ticket instead. Adaptations such as this were important in ensuring an accurate measure of CToM could be established, with the relevance and context of information being directly linked to the understanding and memory of the information (Bellana et al., 2021). Feedback about the story content was collated within the pilot study, with no issues being identified. Whilst authors changed specific details within the stories, such as replacing the car tax disk with a parking ticket, no other changes were made to the content of the story or the follow up questions. No changes were made to any aspect of the scoring of the IMT.

Lastly, the original IMT used a forced answer approach with only true or false options. The current paper added a 'don't know' option to minimize the chance of the correct answer being guessed and potentially impacting the results of the mediation analysis. Any answers in which participants marked 'don't know' were marked as incorrect. If any participant answered 'don't know' to more than 50% of the questions, their data was removed in the final analyses for this measure. Both the original and updated IMTs can be found in Appendix N and Appendix O.

Patient and Public Involvement (PPI)

The study was piloted on three individuals who provided feedback in semi-structured interviews, which were conducted individually and lasted approximately 30 minutes. Changes were made to the design of the study in response to their feedback, including shortening the length of the study and changing the format of instructions to increase clarity. Feedback was also provided on the proposed method of recruitment and recruitment poster in the aim of recruiting a wide sample. Individuals in the PPI sample met the inclusion and exclusion criteria of the main study and were recruited via social media. A £30 Amazon voucher was provided to each individual for their time. Feedback from the pilot study is attached in Appendix P.

Analysis

Data was collected via Qualtrics and stored in Microsoft Excel. Measures were taken when designing the data collection process to screen for bots, including a CAPTCHA task, open questions which required written answers and a ReCAPTCHA score, with scores of below 0.5 indicating a potential bot (Qualtrics, 2024). Visual screening of the three components combined was completed to remove any suspicious datasets.

Prior to data analysis, data was screened to ensure all assumptions were met, including addressing outliers. Outliers were addressed via Winsorization, in which the outlier is replaced by the next highest or lowest value which is in the range of normal distribution (Field, 2014). Missing data was addressed using the following approach, 1) when 10% or less of the participant data is missing on an individual measure, the missing data was replaced by the sample mean for that item (Byrne, 2016). 2) when more than 10% of participant data was missing from an individual measure, data was excluded from this specific measure only. Should the participant's data from other measures include less than 10% of missing data, they were included in these measures for the analysis (Cohen et al., 2013). 3) Should a participant have missing data of greater than 50% of their entire dataset, they were removed from the main analyses (Papageorgiou et al., 2018). Given all measures were forced answer

apart from the CATS, the CATS is the only measure that may encounter missing data providing the participant completed the entire study.

Following data cleaning, a linear regression was completed for research question one, and a mediation analysis for research question two. Only total scores of the above measures were used in the main analyses, however, subscales of the CATS were used in post-hoc analyses which are outlined as exploratory in the results section. All data cleaning and analyses were completed using SPSS Version 22, and PROCESS (Hayes, 2022).

Results

Whilst 145 participants started the study, only 92 participants completed all measures. One participant was later removed for having more than 50% of data missing, leaving 91 participants in the below analyses (see Table E1 for demographics). Figure 1 highlights the flow of participants at each stage of the study.

Due to this high attrition rate, a Little's MCAR test was used to investigate whether any patterns in drop out could be identified. According to the test, data were missing at random, (x^2 = 1273.67, df = 1506, p = 1.00). To explore differences within demographic groups relating to the attrition rate, further Pearson's Chi Squared analyses were completed. No significant results were identified in any of the recorded demographic groups; gender (p = .440), ethnicity (p = .467), employment status (p = .334) and type of device (p = .535).

Descriptive statistics are reported in Table E2 and will therefore not be repeated in the main analysis write ups below.

Figure E1

CONSORT Diagram Illustrating the Flow of Participants at Each Stage of the Study

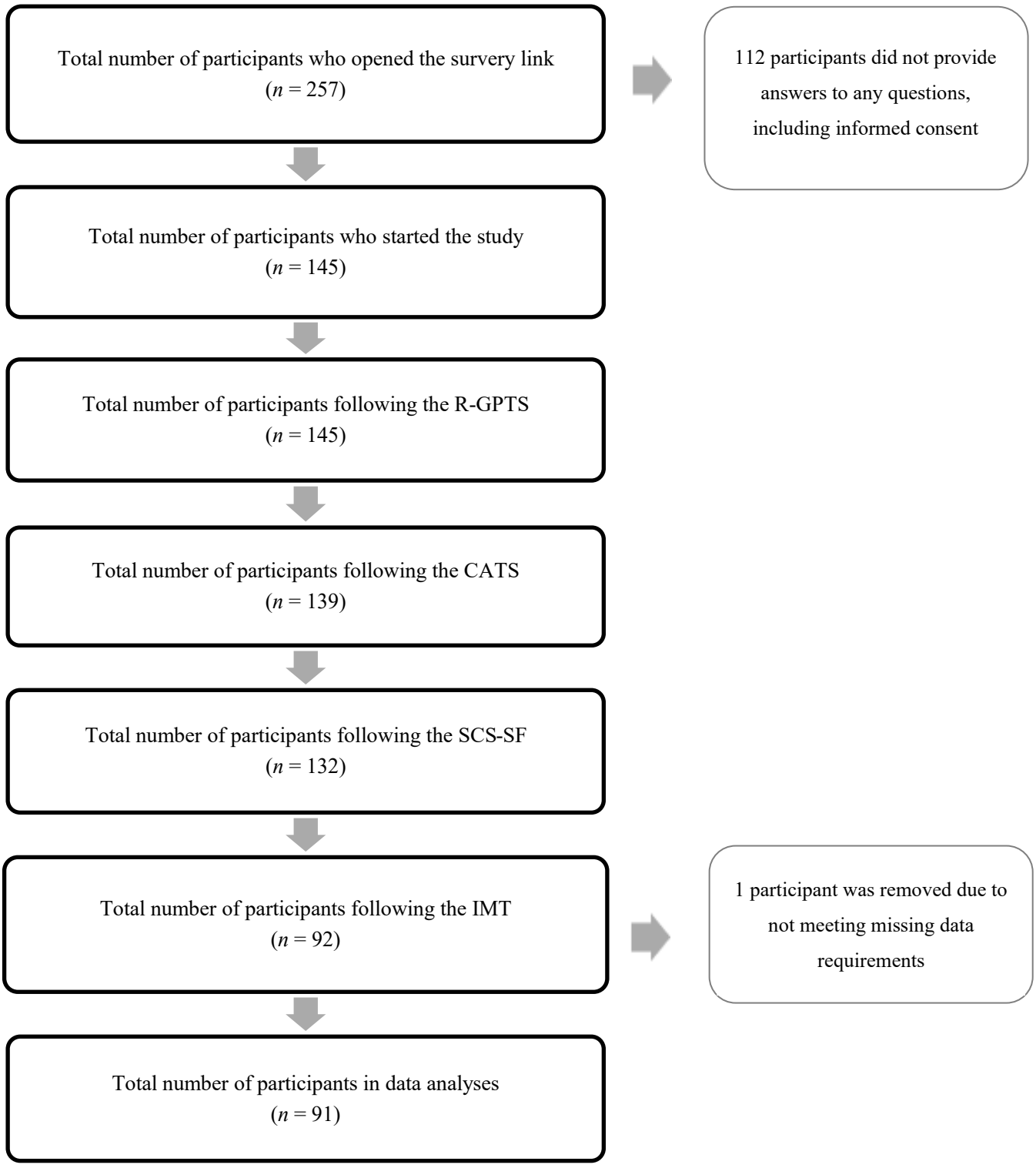


Table E2

Descriptive Statistics After the Removal of Outliers (n = 91)

Measure	Maximum Score for the Measure	Mean	SD	Range	Range (before removal of outliers)
R-GPTS	72	14.44	13.54	0 - 47	0 – 68
CATS (Total Score)	152	36.16	26.38	0 - 105	0 - 116
CATS (Neglect Subscale)	100	24.51	19.50	0 - 67	0 - 76
CATS (Punishment Subscale)	28	9.84	5.08	0 - 20	0 - 22
CATS (Sexual Abuse Subscale)	24	0.78	1.20	0 - 3	0 - 20
SCS-SF	60	33.90	9.88	N/A	14 – 54
IMT (ToM Subscale)	49	32.16	6.29	11 - 42	18 - 42
IMT (Factual Subscale)	25	20.44	2.54	15 – 25	12 - 25

Research Question One

For research question one, 91 participants were included in the data analysis. Whilst 92 participants met requirements for missing data, one participant answered ‘don’t know’ to more than 50% of the IMT items and was therefore excluded. A linear regression was completed to investigate whether total scores on the CATS predicted total CToM scores on the IMT. Whilst data met most assumptions, distribution was not normal across either variable, therefore 5000 bootstrapped resamples were used during analysis. The regression model was non-significant ($R^2 = .033$; $F\,(1,89) = 2.99$, $p = .087$).

Additional exploratory analyses were completed using each subscale of the CATS. 21 outliers were identified across the three subscales, 15 on the sexual abuse scale, one on the punishment scale and five on neglect. All were at least 2.5 standard deviations above the mean. Outliers were addressed as above, with data again being bootstrapped due to lack of normal distribution. Both the sexual abuse and punishment subscales highlighted non-significant results in linear regression analyses, with respective models of (R^2 = .018; F (1,89) = 1.61, p = .208) and (R^2 = .007; F (1,89) = .62, p = .433). A further linear regression identified scores on the neglect subscale of the CATS as a marginally significant predictor of CToM scores on the IMT (R^2 = .040; F (1,89) = 3.99, p = .049), with higher scores on the neglect subscale predicting lower CToM scores on the IMT (β = -.21, b = -.07). This highlights a large effect size (Cohen, 2016), with scores on the neglect subscale accounting for 43% of the variance in CToM scores.

Research Question Two

Mediation analyses were completed to explore the role of CToM in the relationship between developmental trauma and paranoia. Whilst all other assumptions were met, two outliers were identified within the paranoia scale and were replaced with the highest score within the SD range via Winsorization. Efforts were made to follow the missing data procedure outlined in the analysis section which would allow individuals who did not complete the entire study to be included in any measures they had completed. However, SPSS did not allow data to be included in mediation analyses unless there was a data entry for each measure, which authors were unaware at the time of creating the missing data policy. Due to this, only participants who had completed all measures could be included within the mediation analyses (n = 91). All mediation analyses described below used 5000 bootstrapped resamples (Abu-Bader & Jones, 2021).

An initial analysis was completed looking at the mediating role of CToM between developmental trauma and paranoia without controlling for self-compassion. Results highlighted that CToM did not significantly mediate this relationship. (b = -.01, Bootstrapped SE = .01, 95% CI [-.04, .01]). The mediation model is outlined in Figure 2 and highlights that whilst developmental

trauma significantly predicted paranoia, neither developmental trauma or paranoia were significantly related to CToM.

A further mediation analysis was completed controlling for self-compassion. Despite this, no significant changes were observed in the nature of the relationship, with CToM not identified as a significant mediator between developmental trauma and paranoia again *(b* = -.005, Bootstrapped SE = .01, 95% CI [-.04, .02]). Similar patterns were identified to the initial mediation analysis, with the only significant relationship identified between developmental trauma and paranoia, as seen in Figure 3.

Figure E2

Path Models from the main Mediation Analysis, looking at the role of CToM between Developmental Trauma and Paranoia

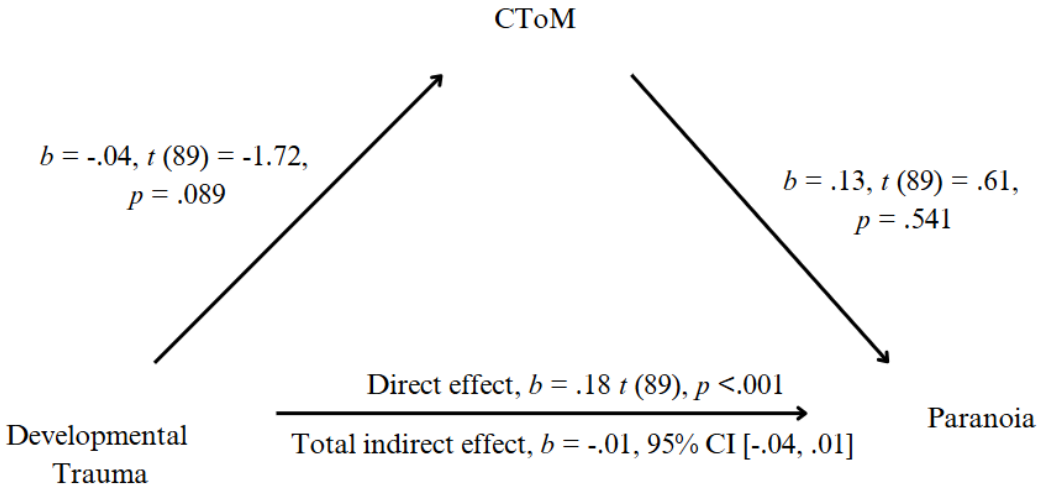
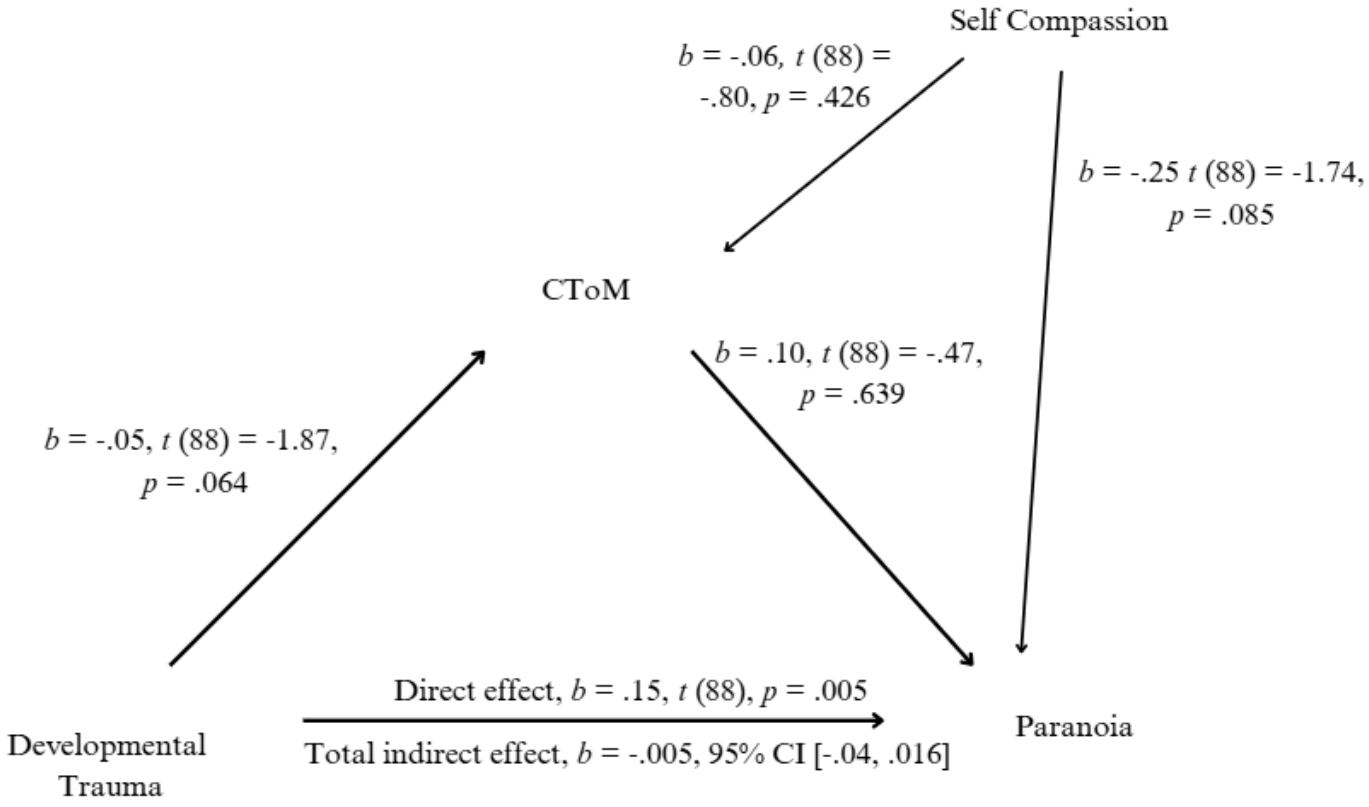


Figure E3

Path Models from the main Mediation Analysis, looking at the role of CToM between Developmental Trauma and Paranoia when controlling for Self-Compassion.



A final mediation analysis was completed using the neglect subscale of the CATS as the predicting variable and controlling for self-compassion. This was due to results from research question one, which highlighted neglect as being a significant predictor of poor CToM. Despite the significant finding in research question one, CToM was not found to significantly mediate the relationship between neglect and paranoia when controlling for self-compassion, with total mediation scores of (*b* = .007, Bootstrapped SE = .02, 95% CI [-.053, .022]). As this was completed as a post-hoc, sensitivity analysis only, a pathway diagram is not included. Table E3 below highlights the bivariate associations between each variable included within the mediation analyses.

Table E3

Table of Bivariate Associations

	Developmental Trauma	Paranoia	CToM	Self-Compassion	Neglect
Developmental Trauma	1	.344*	-.180	-	-
Paranoia	.344*	1	-.001	-.266*	.318*
CToM	-.180	-.001	1	-.030	-.193
Self-Compassion	-	-.266*	-.030	1	-.289*
Neglect	-	.318*	-.193	-.289*	1

*Note. calculated with Pearson's Correlations. * Indicates statistical significance.*

Post-Hoc Exploratory Analyses

Following the mediation analysis, post hoc, exploratory analyses were completed to look at data collected from the IMT. The first was a Pearson's correlation looking at the relationship between scores on the factual subscale and CToM subscales of the IMT. This was to ensure that the data followed the same pattern identified in the original paper completed by Kindermann et al., (1998). The second exploratory analysis was a repeated measures ANOVA exploring whether differences were identified for CToM scores between the different stories. This was completed after the mean scores for each scores appeared different when writing up descriptive statistics.

These exploratory analyses were identified as important in the interpretation of the data to ensure that scores on the CToM task were not influenced by a lack of comprehension of the study overall. Given the changes made to the design of the IMT within the current paper, including the story content and method of delivery, these exploratory analyses help to ensure that CToM scores are an

accurate representations of CToM ability and not influenced by overall comprehension or study design.

For the Pearson's correlation between the CToM subscale and the factual subscale of the IMT, 5000 bootstrapped resamples were used due to a negative skew within the distribution using 95% confidence intervals, with *(n* = 91). Results showed that scores on the CToM subscale on the were positively correlated with the factual subscale, r (89) = .517, $p < .001$, 95% *C.I.* [.348, .653]. This indicates that participants who scored higher on the CToM subscale also scored higher on the factual subscale in comparison to participants who scored lower on both the CToM and factual subscales. Results indicate a large effect size (Cohen, 2016), with scores on the CToM subscale accounting for 26.73% of the variance in scores on the factual subscale. Table E4 outlines descriptive statistics for the factual questions for each story.

Table E4

Mean and Standard Deviations for each Story on the CToM Subscale of the IMT (n = 91)

	Mean	Standard Deviation
Story 1	5.09	1.60
Story 2	7.46	1.64
Story 3	6.75	1.87
Story 4	6.44	2.07
Story 5	6.43	1.85

Finally, a repeated measures ANOVA was completed to compare the mean CToM scores for each story, (see Table E3 for descriptive statistics). Results of Mauchley's test indicated that the data did not meet the assumption of sphericity, X^2 (9) = 24.47, p = .004, therefore results will be reported using the Greenhouse-Geisser correction (ε = .87). The results highlighted that CToM scores for each story significantly differed from each other in the overall model F (3.47, 312.53) = 31.53, $p < .001$, w^2

= .96. Whilst the model overall is significant, Table E5 indicates that the most significant difference was between the first and second story and that answers between stories became less significant following this. Whilst the assumption of normality was violated in this analysis, it was deemed most appropriate due to the lack of non-parametric options or bootstrapping within this design. When looking at only story one and two, all assumptions are met for parametric tests so a follow up paired t-test was completed between these two datasets only. The t-test highlighted participants scored significantly higher on story 2 in comparison to story 1, t (90) = -11.70, $p < .001$, 95% C.I. [-2.78, -1.97], d = -1.23 with a large effect size (Cohen, 2016).

Table E5

Probability, Effect Size and F for Stories on the CToM Subscale of the IMT (n = 91)

	p	*F*	w^2
Story 1 vs Story 2	<.001	136.80	.599
Story 2 vs Story 3	.002	9.84	.089
Story 3 vs Story 4	.240	1.40	.004
Story 4 vs Story 5	.956	.003	-.011

Discussion

Discussion of Findings

The current paper aimed to build on existing knowledge looking at the relationship between developmental trauma, CToM and paranoia. With two distinct research questions, it was hypothesized that 1) experiences of developmental trauma would significantly predict lower CToM ability, and 2) poor CToM ability would significantly mediate the relationship between developmental trauma and

paranoia, with participants with poor CToM ability scoring higher on the measure of developmental trauma and paranoia.

For research question one, findings did not support the above hypothesis and indicated that the overall CATS score did not predict CToM ability. Whilst this does not support the above hypothesis, follow up analyses were completed using the individual subscales of the CATS. Results indicated that only the neglect subscale predicted CToM ability, with no significant relationship identified between CToM and either the sexual abuse or punishment subscales. This finding has two important implications which deepen the existing understanding of this relationship. Firstly, it supports previous literature which highlights the importance of using tools which measure trauma sensitively (Peterson et al., 2024). Should this distinction between different types of traumatic experiences have not been explored within the current paper, the significant relationship would not have been identified. Secondly, it highlights neglect specifically as being related to deficits in CToM in comparison to other types of traumatic experiences. This is in line with previous research which found children who experienced neglect performed less accurately on an AToM task in comparison to children in either a control group or children who had experienced other types of abuse (Cicchetti et al, 2000). With deficits in both CToM and AToM associated specifically with neglect, it is possible that the experience of neglect is in some way different to that of other traumas which leads to this significant association.

One potential explanation for this link with neglect may be observed when looking at its defining characteristics. Neglect can be defined by the chronic absence of attunement from a primary caregiver which leads to basic needs not being met during formative years (Dubowitz et al., 1993). This understanding separates neglect from other types of traumatic experience, which instead of being defined by the absence of experiences, are defined by the presence of even one-off traumatic experiences (e.g. sexual abuse). Whilst traumatic experiences such as sexual abuse are undeniably harmful, there is not necessarily the same chronicity that is associated with neglect, with the possibility to have positive interactions with primary caregivers which enables CToM to be developed. Whilst causality cannot be established from the current findings, a link is evident between the nature

of the experiences of neglect and observable impairments within CToM ability. Perhaps, neglect fails to provide individuals a chance to interact with others and therefore leads to impairments in CToM ability, supporting the theory that ToM is learnt through social experiences (Garfield et al., 2001). An alternative suggestion may be that caregivers struggle to attune to children who lack CToM, and therefore find it more difficult to meet their needs, supporting the discussion that ToM ability has innate constructs (Meltzoff, 2002). Whilst there is an argument that the two theories are not mutually exclusive and that a combination of innate structures and developmental experiences are likely to both contribute to ToM development (Meltzoff, 1999), the current research is unable to draw causality claims and therefore does not provide specific support for either theory. Future research may wish to continue focusing on the mechanisms of this relationship to further develop our understanding of how neglect and CToM are associated.

A further possible explanation of the significant finding on the neglect subscale only, specific to the current study, may be identified when looking at the distribution of the scores for each subscale of the CATS. Whilst the sexual abuse and punishment subscales showed minor variance within scores and indicated very low experiences of trauma within the sample, a wider range of scores was identified on the neglect subscale. This wider range of scores may perhaps be explained when considering the differences between neglect and sexual abuse or punishment discussed above. Whilst sexual abuse and punishment would be defined by the presence of certain experiences and are therefore potentially more binary in nature, neglect is defined by the absence of certain experiences and may therefore potentially be more subjective to the individual's perception of the experience. Whilst low scores across the subscales were anticipated within the non-clinical sample, it is possible that floor effects across the sexual abuse and punishment subscales inhibited any relationships from emerging. Should future research be able to capture a wider range of answers, alternative findings may be identified.

Finally, it is important to acknowledge that this paper used a cross-sectional design, and it is therefore unknown whether the relationship between CToM and neglect identified would remain over

a long period of time. Future research may be helpful to replicate this study using a longitudinal approach to deepen the understanding of the relationship between these variables.

The research paper's second research question explored the mediating role of CToM between developmental trauma and paranoia. Whilst previous research did not find significant results when focusing on AToM, recommendations regarding methodological design were presented for future research (Monastra, 2018) and were implemented within the current paper. Despite the changes in methodological design, results of the current paper highlighted that CToM was not a significant mediator between developmental trauma and paranoia, as seen in Figure 1. Given the significant result in research question one for only the neglect subscale of the CATS, the mediation was run again in a post-hoc analysis using the neglect subscale as the independent variable. This again highlighted insignificant results, highlighting no mediating role of CToM between neglect and paranoia. These findings continue to support previous literature which have highlighted non-significant findings (Monastra, 2018), despite the changes to methodological design which allowed for a more sensitive data analysis to take place.

When looking at the mediation analysis in Figure E1, significant pathways can be identified between developmental trauma and paranoia. This supports previous literature which has identified associations between developmental trauma and higher levels of paranoia (Carmichael, 2019). When looking at Figure E1, a non-significant finding is particularly evident in the pathway between CToM and paranoia, (p = .639), with a visual inspection of a scatterplot indicating no observable relationship between these variables. Whilst this finding does not support previous literature which has identified a significant relationship between ToM and paranoia (Chan & Chen, 2011), much of this literature was completed within clinical samples with schizophrenia diagnoses. Exploring this further, a potential explanation may be identified when looking at the scores identified on the paranoia scale. With a mean score of 14.44, an 'average' level of paranoia was observed within the current sample when consulting the scoring guidelines (Freeman et al., 2021). With the current study redacting higher levels of paranoia within the dataset via Winsorization after the identification of outliers, future research which captures a wider range of paranoia scores may find different results.

Finally, an exploration into CToM was completed to further investigate these findings. The factual questions were included as a baseline measure to ensure participants general comprehension of the IMT. The mean score of 20.44 out of a maximum score of 25 indicates that participants did have a good understanding of the stories and that scores on the CToM scale were likely representative of CToM ability. A repeated-measures ANOVA was completed after differing mean scores were identified across the different stories within the IMT. These findings indicated that participants scored significantly lower on the initial story, before scoring consistently higher on the remaining stories. Whilst this could be reported as practice effects, it is important to note that CToM ability itself is unlikely to improve significantly after practicing a task once. Previous literature using a similar ToM task involving stories identified no practice effects for participants, even after the completion of a four session ToM training in a non-clinical, adult sample (Santiesteban et al., 2012). More likely, these findings suggest participants did not fully understand the nature of the task when first completing it, suggesting lower scores at the start of the task may not be representative of true CToM ability. Despite this possibility, further exploratory mediation analyses which included only the latter stories continued to identify non-significant findings. Whilst this therefore makes the 'practice effects' non-significant to the current study, future research using the IMT may wish to include an unscored practice story to allow a more accurate CToM score to be established.

Strengths

One key strength of the current paper is the methodological design, including the choice of the questionnaires in line with recommendations from previous literature (Monastra, 2018; Peterson et al., 2024). Whilst previous research has largely chosen to capture data using broad constructs such as 'psychosis', the current paper refined variables to allow a more sensitive data analysis to be completed. Additionally, authors chose to update stories of the IMT to increase relevance to the intended sample. It was hoped that this, along with the reduction of 50% of the factual questions, would help mitigate confounding variables such as poor comprehension of the story and participant fatigue, allowing for a more accurate measure of CToM to be recorded.

A further strength of the current paper was the use of a pilot study within a PPI sample matching the inclusion and exclusion criteria of the study participants. The use of a pilot study allowed authors to obtain feedback on the study design and make relevant adaptations in response to this. Some of the feedback from the PPI sample included instructions being unclear at times and finding the length of the study too long. This feedback allowed changes to the study design to improve the clarity of instructions and reduce participant fatigue, reducing the chance of results being impacted by methodological flaws.

Limitations

One limitation of the current study was the lack of diversity within the demographics of the participant sample. Whilst efforts were made to recruit a diverse sample, the participant sample was largely of a white, female demographic. Whilst this is not in itself a limitation, consideration should be made about the generalizability of the results. With gender differences being identified in scoring of the CATS, with males scoring higher on the punishment scale and females scoring higher on sexual abuse scale (Sanders & Becker-Lausen, 1995), it is possible that a more diverse sample would have populated different results. Similarly, with a high percentage of the sample identifying as white in ethnic background, the results are potentially not representative for individuals from different ethnic backgrounds.

Whilst the CATS was chosen due to its ability to capture the subjective perception of traumatic experiences rather than the presence of the event itself, and it allows for some measure of sensitivity to be captured using a Likert scale, it may be an underrepresentation of overall traumatic experiences that are not included within this list. To the knowledge of the authors at the time of writing, the CATS has not been validated cross-culturally and may therefore not accurately capture the experiences of individuals unique to minority ethnic backgrounds, such as racial trauma or displacement. With this in mind, it is important that there is careful consideration when choosing tools measuring trauma in any future research in this area aiming to recruit wider samples.

Additionally, the IMT was chosen due to its ability to capture CToM within an adult, non-clinical population. However, it is important to note that to the authors knowledge this measure has not been validated. Therefore, CToM scores from this measure should be interpreted tentatively. A future validation study for the IMT would ensure that CToM was being reliably and validly recorded, increasing the robustness of findings for research within this area.

A further limitation of the current study was the relatively high attrition rate observed within the dataset. Whilst the MCARs test indicated the data was missing at random, a visual scan of the data highlights that most participants completed the initial measures and slowly stopped participation at either the start of the IMT or midway through, indicating this measure as potentially most burdensome for participants. This was somewhat expected, and measures were taken to try and counteract this, including choosing a short measure for self-compassion and removing 50% of the factual questions in the IMT. Additionally, the missing data policy was chosen as such to allow for data to be included in the final analyses should some measures be fully completed prior to the participant dropping out. At the point of data analysis, it was identified that SPSS allows only a list-wise mediation analysis to be completed and therefore participants could not be included in the analysis unless they had completed all measures. Discussion took place around completing an analysis using only data from the first measures to utilize this data, however, this was not completed in the interest of following the pre-registered study protocol. Future research should continue to consider ways to reduce participation burden to mitigate the risk of participants providing their time and data but be unable to be included in the data analyses.

Recommendations

Recommendations from this paper include the continuation of research within this area, making relevant adaptations to methodology as appropriate. Findings from this paper indicate that practice tasks may be helpful in complex measures such as the IMT, with scores on practice questions not being included in the final analysis. Additionally, future research may wish to continue redefining the variables used within the analysis as recommended previously by Monastra (2018). The current

paper identified a significant negative relationship between developmental neglect and CToM, potentially making this a helpful focus for research within this area. Whilst the current paper chose to focus on paranoia within a non-clinical sample, it is possible that different results may be obtained within a clinical sample or when focusing on different characteristics of psychosis.

Before making any firm clinical recommendations, future research is needed within clinical populations. It is possible that with future significant results, suggestions to improve clinical practice may be identified, including 1) screening for CToM in clinical assessments with individuals who have experienced trauma or psychosis, 2) including CToM in clinical formulations with the consideration of how deficits may precipitate or perpetuate symptoms of psychosis following developmental trauma, and 3) incorporating mentalization based therapies within psychological interventions supporting individuals who have experienced psychosis following developmental trauma. Whilst these suggestions could be considered dependent on findings of future research in the area, the non-significant findings of the current paper overall do not warrant recommendations to clinical practice at present.

Conclusions

In conclusion, this paper identified neglect to significantly predict lower CToM ability, however, overall scores for trauma, sexual abuse and punishment did not. CToM was not found to mediate the relationship between developmental trauma and paranoia, even when controlling for self-compassion. Methodological issues were discussed which may have influenced results and recommendations for future research were outlined, including recruiting clinical samples, continued refinement of variables and the use of practice stories when using the IMT. Whilst the current paper built upon existing knowledge within this area, future research is needed before clinical implications can be confidently drawn.

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Appendix A Journal Choice and Author Guidelines

Both the systematic review and empirical project have been written in accordance with the specification of The British Journal of Psychology. The British Journal of Psychology was chosen as an appropriate journal for both chapters for several reasons, including 1) a good impact factor score of 3.31 indicating the research may be widely accessed, 2) a generous word count of 8,000 words, allowing me to provide sufficient detail required for doctoral thesis submission, and 3) the shared interests between my papers and the journal.

To ensure the chapters are formatted to journal specifications, I have used headings which are stated in in the author guidelines. The author guidelines also advise that 1) tables and figures can be provided within the text or as a separate document, I have included them within the main text of the thesis to improve overall readability, 2) numbers under ten should be written in text, unless they are part of a longer list or included as a unit of measurement, numbers above ten should be written in number format and 3) the abstract does not count to the word count, but should be no longer than 150-200 words.

The British Journal of Psychology accepts papers that are up to 8,000 words in length, not including references, tables, figures or the abstract. Within the thesis, the systematic review currently is over this word count, at 9,164 words. This is due to the large number of in-text citations used to synthesize findings across the results and discussion sections. This will be easily resolved when submitting for publication as the journal accepts any APA formatted, referencing system. Therefore, I will implement a number system across the references to reduce the word count when submitting for publication. This was not completed prior to the point of submitting the thesis to improve consistency across the thesis, with the same formatting across all three chapters. This decision made by myself and my supervisors.

Whilst the total number of in-text citations is unknown, the current word count seemed an appropriate estimate figure for this submission. ChatGPT was used to find a more accurate word count, however, results were vastly inaccurate (see Appendix Q).

Further information and full author guidelines can be found here if required, https://bpspsychub.onlinelibrary.wiley.com/hub/journal/20448295/homepage/forauthors.html.

Appendix B Prospero Form

Please complete the template below drawing on the guidelines provided by Prospero (PROSPERO registration form.pdf). Please note that this template is slightly modified from the template on Prospero so that 1) you have space to explain the scientific and clinical rationale for your review (a key learning outcome of the module), and 2) to anonymise your protocol for the purposes of marking.

1.* Review title.

Exploring the Effectiveness of Compassion-Focused Therapy in Clinical and Non-Clinical Populations who experience Positive Symptoms of Psychosis or Psychosis-Like Experiences.

Background/Rationale

Psychosis is an umbrella term used to describe a number of different symptoms relating to a person's thoughts, behaviours and perceptions of reality (Arciniegas, 2015). Symptoms of psychosis can be categorized into positive and negative symptoms (Andreasen & Grove, 1986). Positive symptoms include hallucinations, delusions and disorganised behaviour, speech or thoughts, whereas negative symptoms include, self-neglect, social isolation and reduced emotional affect and motivation (NICE, 2024). Whilst these symptoms are often associated with formal mental health diagnoses, theory suggests these symptoms are not exclusive to clinical samples and that psychosis in fact lies on a continuum (van Os et al., 2009). Findings from research using non-clinical samples supports this theory, with symptoms of psychosis reported by individuals without formal mental health diagnoses (Verdoux & van Os, 2002). This finding may be due to several reasons, including the presence of symptoms which are not severe enough to meet diagnostic threshold (Rössler et al., 2015), and factors impacting help-seeking behaviour making individuals less likely to present to mental health services and receive a mental health diagnosis (Anderson et al., 2010). When a person experiences the positive

symptoms listed above, but does not have a formal diagnosis relating to psychosis, these experiences can be referred to as 'psychosis-like experiences' (PLEs) (Lee et al., 2016).

Self-compassion refers to an individual's ability to be kind to oneself, with an aim of taking a non-judgemental stance to one's own thoughts, behaviours and general experiences (Neff & Dahm, 2015). The ability to be self-compassion varies between individuals and can be associated with life experiences such as having a secure attachment style (Huang & Wu, 2024) and good quality sleep (Brown, 2021). Conversely, low levels of self-compassion have been associated with adverse childhood experiences (Zhang et al., 2023) and low perceived social support (Yang et al., 2023).

Associations between low levels of self-compassion and PLEs have been identified within both clinical (Eicher et al., 2013) and non-clinical samples (Scheunemann, 2019). Findings have highlighted that individuals who experience higher levels of self-compassion not only experience less frequent PLEs, but also experience less distress from their PLEs (Scheunemann, 2019). With this in mind, research is currently investigating the use of compassion-focused therapy (CFT) within this population. It is hoped that by increasing self-compassion through CFT principles, individuals who undertake this intervention may also experience a reduction in PLEs.

Clinical trials have supported this theory, with improvements noted in the individuals' mood, beliefs about their illness, positive and negative affect (Braehler, 2013), levels of paranoia (Lincoln et al., 2013) and hallucinations (Mayhew & Gilbert, 2008) following a compassion-based intervention. Further support has also been identified using individual case studies, in which several improvements within PLEs were again found following a compassion-based therapeutic intervention (Heriot-Maitland & Levey, 2021; Kennedy & Ellerby, 2016).

The aim of the current systematic review is to synthesize findings from this literature and provide a coherent, comprehensive narrative of the evidence base for compassion-focused therapy for the treatment of PLEs. Whilst previous systematic reviews have included specific symptoms of psychosis within their review (Maner, 2023) or have conducted systematic reviews looking at the association between compassion and psychosis in clinical settings (Mavituna et al., 2023), authors are not aware of any reviews that capture the narrative of the intended review. Authors have carried out

scoping searches using the search terms in the below sections, with results highlighting sufficient results for this to be a feasible systematic review (1,043 papers).

To ensure the review will be a novel contribution to existing research and will include all studies that are relevant to the topic area, specific decisions were made relating to the inclusion and exclusion criteria. Whilst they are discussed in more detail in section 22 (page 11), these include 1) focusing on the effect of CFT for individuals who experience positive symptoms of psychosis, and 2) including studies from both clinical and non-clinical populations.

With the review aiming to provide a novel synthesis of the effectiveness of CFT for individuals experiencing positive PLEs, it is hoped that readers working therapeutically with clients experiencing PLEs may find the review helpful when considering and planning therapeutic interventions.

2. Original language title.

English

3. * Anticipated or actual start date.

09/12/2024

4. * Anticipated completion date.

16/05/2025

5. * Stage of review at time of this submission.

Review stage	Started	Completed

Preliminary searches		x
Piloting of the study selection process		x
Formal screening of search results against eligibility criteria	x	
Data extraction	N/A	
Risk of bias (quality) assessment	N/A	
Data analysis	N/A	

Please note that for the purpose of your summative assignment Prospero questions 6-14 have been deleted to maintain marking anonymity.

15. * Review question.

Does a compassion-focused therapeutic intervention improve therapeutic outcomes in clinical and non-clinical populations experiencing positive symptoms of psychosis?

16. * Searches.

The following databases will be used to search for literature:

- MEDLINE DONE
- APA PsycArticles
- APA PsycInfo

- CINAHL Ultimate
- EMBASE

The search will be completed by the end of January 2025, however, alerts will be set to provide researchers with any new research. The search will also be re-run prior to the final analysis to ensure all relevant/appropriate literature has been included on 18/04/2025.

Grey literature will be included should it meet all inclusion and exclusion criteria stated in section 22. Searches for grey literature will include:

- Google
- Google Scholar
- Open Access Theses and Dissertations
- DART Europe

17. URL to search strategy.

For the purpose of this assignment please outline your search strategy here. You can provide additional detail at the end of your protocol as an appendix (e.g. any subject header searches you are planning in particular databases).

Search Terms:

"compass*" OR "Compassion focused therapy" OR "CFT" OR "self-compassion" OR "compassionate mind training" OR "compassionate imagery intervention" OR "compassionate focused intervention"

AND

"schizo*" OR "psychosis" OR "psychotic" OR "hallucination" OR "hear* voices" OR "delusion*" OR "fixed beliefs" OR "paranoi*" OR "schizoaffective disorder" OR "Schizophrenia"

OR “Voice hearing” OR “Positive symptoms” OR “paranoid” OR “Psychosis-like experiences” OR “PLEs” OR “Perceptual abnormalities” OR “thought disturbance” OR “thought disorder” OR “disorgani?ed behavio#r” OR “disorgani?ed speech”

When searching for papers, no criteria will be set relating to the date of the research in the aim of including all relevant papers.

18. * Condition or domain being studied.

The systematic review will be exploring the effectiveness of compassion focused therapy on therapeutic outcomes in both clinical and non-clinical samples experiencing positive symptoms of psychosis.

Population: People over the age of 14 who experience positive symptoms of psychosis (with or without a formal mental health diagnosis). The age of 14 was chosen as the lowest age of inclusion, due to some adult early intervention in psychosis services offering treatment from the age of 14. This is in line with previous literature (Tiller et al, 2023).

Intervention: A compassion-focused psychological intervention delivered which includes direct interaction with the facilitator (e.g., in person, online, telephone call).

Compared with: either 1) a control group, or 2) baseline measures completed prior to the compassion-focused intervention (i.e., pre and post outcome measures).

Outcome of interest: therapeutic outcomes (e.g., symptom severity, levels of distress, general wellbeing), measured on standardised outcome measures.

19. * Participants/population.

Participants in the included studies must:

1) be human.

2) be over the age of 14

3) experience positive symptoms of psychosis (e.g., hallucinations, paranoia, delusions).

20. * Intervention(s), exposure(s).

The review will include papers in which participants have completed a compassion-focused psychological intervention. Whilst the exact nature and length of the intervention may vary, the intervention must include direct contact with a facilitator (online, in person or telephone call). Interventions which do not include a direct contact will be excluded (e.g., the use of only virtual reality or pre-recorded videos).

21. * Comparator(s)/control.

To explore the effectiveness of the CFT intervention, studies must use outcome measures as a comparative tool against either a control group or baseline measures

22. * Types of study to be included.

The review will include randomised control trials, non-randomised control trials, theses and case reports providing they meet all criteria mentioned below.

The review will exclude reviews, chapters, conferences and abstracts.

Inclusion Criteria

Papers must:

1) be written in English.
2) include clinical and/or non-clinical samples who experience positive PLES (i.e., hallucinations, paranoia, delusions, thought disorder, speech disorder).

3) include a compassion-focused intervention which includes direct interaction with a facilitator (i.e., online, telephone call or in person).
4) use standardised measures to record therapeutic outcomes, e.g. distress, quality of life, symptoms of psychosis.
5) use either a control group or baseline measures (pre and post outcome scores) as a comparator.

Exclusion Criteria:

1) Papers will not be included if they do not compare therapeutic outcomes with either baseline measures (pre-post outcome measures) or a control group.
2) Qualitative research will not be included in the review. This is because qualitative papers would not be able to accurately compare an individual's experiences of PLEs to an appropriate comparator (either a control group or baselines measures prior to a CFT intervention).
3) Studies which have used a cross-sectional design will be excluded from the literature due to the review not having scope to explore associations. The current review aims to only synthesise the effectiveness of CFT in positive symptoms of PLEs which would not be captured by cross-sectional designs.
4) Studies in which the compassion-focused intervention does not include direct contact with a facilitator (e.g., the use of only pre-recorded videos, online self-help without in-person support or virtual reality)

23. Context.

Clinical and Non-Clinical Samples

The decision was made to include both clinical and non-clinical samples in the current review. This means participants may have diagnoses relating to psychosis (e.g., schizophrenia) or be recruited from within the general population but experience PLEs (e.g., paranoia or voice-hearing). The rationale for this decision was due to the understanding that PLEs lie on a continuum and are therefore

experienced by individuals both with and without formal mental health diagnoses (van Os et al., 2009). Scoping searches within the area have identified research in both clinical and non-clinical samples (Bibbey, 2020; Heriot-Maitland et al., 2023). By focusing on only clinical or non-clinical samples, it is possible that relevant findings within this area would be missed therefore making the narrative incomplete.

The Inclusion of Positive Symptoms of Psychosis and PLEs

Samples within the included papers must experience positive symptoms of psychosis or PLEs. The focus on positive symptoms of psychosis specifically, was made due to the overlapping nature of the negative symptoms of psychosis with several other presentations, such as depression (Krynicki et al., 2018) and anxiety (Wigman et al., 2012). With several existing reviews capturing the effectiveness of CFT for these presentations (Leaviss, & Uttley, 2015: Petrocchi et al., 2024) and the acknowledgement that including all symptoms of psychosis in both clinical and non-clinical samples would be a wide scope to capture within one systematic review. With this in mind, the decision was made to focus only on samples who experience positive symptoms of psychosis and PLEs to ensure the narrative provided can be comprehensive and detailed enough to have helpful clinical implications.

Whilst the samples must experience positive symptoms of psychosis or PLEs, all therapeutic outcomes of the CFT intervention will be reported within the systematic review. This is with the consideration that alleviation of the positive symptom is not always the goal of CFT treatment and therefore excluding other therapeutic outcomes would not provide a complete narrative of the therapeutic impact of the intervention.

CFT Intervention

The compassion-focused intervention must include direct contact with a facilitator (either online, in person or via telephone). The length or type of intervention (e.g., 1:1 or group) will not be

used to exclude any papers, however, this will be documented in the table of results in the final review.

Any papers in which multiple therapeutic interventions were provided to participants at the same time will be included in the review providing the CFT element is sufficiently reported in the methodology, results and discussion.

24. * Main outcome(s).

Therapeutic outcomes following a compassion-focused intervention. Outcomes should be recorded using standardised outcome measures and may include, but are not limited to, experiences such as distress, general wellbeing and symptom severity.

25. * Additional outcome(s).

N/A.

26. * Data extraction (selection and coding).

Study Selection

The screening of articles and data extraction will be managed using computer software Rayyan. The full text screening will be completed by one reviewer with a minimum of 10% of the papers being reviewed by a second independent reviewer. The independent reviewer will be provided with the inclusion/ exclusion criteria of the review, however, will be blind to decisions made by the research team. This is in the aim of increasing inter-rater reliability and increasing replicability for future research. Any differences in the decision-making process will be discussed with another member of the research team.

Data extraction

Data extraction will take place on Rayyan, with the following information being collected: name of first author, year of publication, country of data collection; study design; sample size; demographics of participants (age range and gender percentiles); measure used to record self-compassion; measure used to record theory of mind ability; the main finding of the paper. This information may also be stored on Microsoft Excel as a back-up file.

The rationale for studies being excluded from the analysis will be documented at the point of full text screening only due to the there being the possibility of the initial search resulting in papers unrelated to the research question. If papers have reached the full text screening (and were therefore deemed eligible at the point of screening titles and abstracts), the rationale for the paper being excluded at full text screening should documented to ensure accurate records are kept of the research team's decision-making process and to increase replicability in the future.

27. * Risk of bias (quality) assessment.

The Crowe Critical Appraisal Tool (CCAT; Crowe, 2013) will be used to screen for bias in all papers included in the final review. This tool was chosen due to its ability to screen bias across all methodological designs, using both objective measures (tick boxes) and subjective measures (open questions which requires written detail). This is a helpful aspect of the tool as it allows each included paper to be appraised on the merits of the research rather than comparing it to other research designs.

The CCAT has been found to have good reliability when using the intraclass correlation coefficients with scores of 0.83 for consistency and 0.74 for absolute agreement (Crow et al., 2012) with construct validity also ranging from Kendall's τ 0.70 to 1.00 (Crowe & Sheppard, 2011). The subjective element of the CCAT is an additional strength of the tool which will allow the strengths of each study to be fully captured, which may otherwise have been missed using a tick box (Crowe & Sheppard, 2010).

The papers will be screened for bias by one reviewer using the above methodology, however, a minimum of 10% of the papers will be screened by a second independent reviewer to ensure inter-

rater reliability. Any differences in opinions will be discussed with another member of the research team.

28. * Strategy for data synthesis.

The review intends to synthesise data following the systematic review without a meta-analysis (SWIM) guidelines (Campbell et al., 2020). SWIM guidelines were deemed most appropriate due to the range of different possible findings within the scope of the proposed review. It is unlikely that a meta-analysis would be possible within the proposed review due to limited comparable literature that we anticipate finding (i.e., papers may focus on different symptoms of psychosis throughout both clinical and non-clinical populations). Should a particular pattern or theme arise following full-text screening and there are a sufficient number of papers within the area, a meta-analysis will be considered.

Results will be presented according to PRISMA guidelines for systematic reviews with methodological characteristics and findings presented as a table alongside narrative commentary.

29. * Analysis of subgroups or subsets.

Although analysis between groups is not the focus of the systematic review, literature may be presented in a grouped nature for coherence of the review. Any subgroups will be dependent on results, however, may relate to the symptom of psychosis or by sample demographics (clinical and non-clinical).

30. * Type and method of review.

Type of review:

Cost effectiveness	

Diagnostic	
Epidemiologic	
Individual patient data (IPD) meta-analysis	
Intervention	
Meta-analysis	
Methodology	
Narrative synthesis	
Network meta-analysis	
Pre-clinical	
Prevention	
Prognostic	
Health area of the review	
Prospective meta-analysis (PMA)	
Review of reviews	
Service delivery	
Synthesis of qualitative studies	
Systematic review	x
Other	

Health area of the review:

Alcohol/substance misuse/abuse	

Blood and immune system	
Cancer	
Cardiovascular	
Care of the elderly	
Child health	
Complementary therapies	
Crime and justice	
Dental	
Digestive system	
Ear, nose and throat	
Education	
Endocrine and metabolic disorders	
Eye disorders	
General interest	
Genetics	
Health inequalities/health equity	
Infections and infestations	
International development	
Mental health and behavioural conditions	x
Musculoskeletal	
Neurological	
Nursing	

Obstetrics and gynaecology	
Oral health	
Palliative care	
Perioperative care	
Physiotherapy	
Pregnancy and childbirth	
Public health (including social determinants of health)	
Rehabilitation	
Respiratory disorders	
Service delivery	
Skin disorders	
Social care	
Surgery	
Tropical Medicine	
Urological	
Wounds, injuries and accidents	
Violence and abuse	

31. Language.

English

32. * Country.

Studies from any country will be included providing they are written in the English language. The systematic review is being completed by researchers in England.

33. Other registration details.

N/A.

34. Reference and/or URL for published protocol.

N/A

35. Dissemination plans.

The review will be written with the intention of publication in a peer-reviewed, academic journal. The specific journal has not yet been decided on for submitting for publication.

36. Keywords.

psychosis

positive symptoms

compassion focused therapy

psychological therapy

therapeutic outcomes

37. Details of any existing review of the same topic by the same authors.

To the authors knowledge, there are no existing reviews of the same topic. Additionally, no reviews were identified as already having been registered within this area.

38. * Current review status.

Not yet started.

39. Any additional information

Appendix C PRISMA Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	21
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	26
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	27-32
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	27-32
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	33-35
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	34
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	34
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	32-35
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	35
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	33

Section and Topic	Item #	Checklist item	Location where item is reported
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	35
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	36
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	N/A
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	35
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	N/A
	13c	Describe any methods used to tabulate or visually display results of individual studies and syntheses.	51
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	51
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g. subgroup analysis, meta-regression).	51
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	N/A
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	N/A
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	Table S3, S4 and S5
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	38

Section and Topic	Item #	Checklist item	Location where item is reported
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	38
Study characteristics	17	Cite each included study and present its characteristics.	40
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	47
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Table S3, S4 and S5
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	51-70
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	Table S3, S4 and S5
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	Table S3, S4 and S5
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	N/A
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	39
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Table S3, S4 and S5
DISCUSSION			
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	71-76
	23b	Discuss any limitations of the evidence included in the review.	71-76
	23c	Discuss any limitations of the review processes used.	77

Section and Topic	Item #	Checklist item	Location where item is reported
	23d	Discuss implications of the results for practice, policy, and future research.	78
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	33
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	33
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	33
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	33
Competing interests	26	Declare any competing interests of review authors.	33
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	N/A

Appendix D SWiM Protocol Form

SwiM Reporting Item	Item Description	Page in Manuscript where Item is reported	Other*
Methods			
1) Grouping studies for synthesis	1a) Provide a description of, and rationale for, the groups used in the synthesis (e.g., grouping of population, interventions, outcomes, study design)	51	
	1b) Detail and provide rationale for any changes made subsequent to the protocol in the groups used in the synthesis	33	
2) Describe the standardised metric transformation methods used	Describe the standardised metric for each outcome. Explain why the metric(s) was chosen and describe any methods used to transform the intervention effects, as reported in the study, to the standardised metric, citing any methodological guidance consulted	N/A	
3) Describe the synthesis methods	Describe and justify the methods used to synthesise the effects for each outcome when it was not possible to undertake a meta-analysis of effect sizes.	52	
4) Criteria used to prioritise results for summary and synthesis	Where applicable, provide the criteria used, with supporting justification, to select the particular studies, or a particular study, for the main synthesise or to draw conclusions from the synthesis (e.g., based on the study design, risk of bias assessments, directness in relation to the review question)	N/A	

5) Investigation of heterogeneity in reported effects	State the method(s) used to examine heterogeneity in reported effects when it was not possible to undertake a meta-analysis of effect estimates and its extensions to investigate heterogeneity	51
6) Certainty of evidence	Describe the methods used to assess the certainty of the synthesis findings	Tables S2, S3, S4 and S5
7) Data presentation methods	7a) Describe the graphical and tabular methods used to present the effects (e.g., tables, forest plots, harvest plots)	52
	7b) Specify key study characteristics (e.g., study design, risk of bias), used to order the studies, in the text and any tables or graphs, clearly referencing the studies included.	52
Results		
8) Limitations of the synthesis	For each comparison and outcome, provide a description of the synthesized findings and the certainty of the findings. Describe the result in language that is consistent with the question the synthesis addresses, and indicate which studies contribute to the synthesis.	Tables S3, S4 and S5
Discussion		
9) Limitations of the synthesis	Report the limitations of the synthesis methods used and/or the groupings used in the synthesis and how these affect the conclusions that can be drawn in relation to the original review question	78

PRISMA = Prisma Reporting Items for Systematic Reviews and Meta-Analyses.

*If the information is not provided in the systematic review, give details of where this information is available (e.g., protocol, other published papers, or website)

Appendix E – Table of Outcome Measures

First Author, Year	Outcome Variables	Outcome Measures Used
Heriot-Maitland (2023)	1) Psychosis Symptoms	1) Psychotic Symptom Rating Scale (PSYRATS)
	2) Depression, Anxiety & Stress	2) Depression, Anxiety and Stress Scale (DASS-21)
	3) Psychological Distress	3) Clinical Outcomes in Routine Evaluation (CORE)
	4) Dissociation	4) Revised, Dissociative Experiences Scale (DES-II)
	5) Social Safeness	5) Social Safeness and Pleasure Scale (SSPS)
	6) Social Comparison	6) Social Comparison Scale (SocCS)
	7) Self-Criticism and Self-Reassurance	7) Forms of Self- Criticizing/Attacking and Self- Reassuring Scale (FSCSR)
	8) Self-Compassion	8) Self-Compassion Scale—Short Form (SCS-SF)
	9) Beliefs About Illness	9) Personal Beliefs about Illness Questionnaire— Revised (PBIQ-R)
Braehler (2013)	1) Depression	1) Beck Depression Inventory-II (BDI-II)
	2) Compassion and Avoidance	2) Narrative Recovery Style Scale (NRSS)
	3) Beliefs About Illness	3) The Fear of Recurrence Scale (FORSE)
	4) General Symptomology	The Personal Beliefs about Illness Questionnaire-Revised (PBIQ-R)
	5) Positive and Negative Affect	4) Clinical Global Improvement Scale
		5) The Positive and Negative Affect Scale (PANAS)

First Author, Year	Outcome Variables	Outcome Measures Used
DeTore (2023)	1) Depression	1) Beck Depression Inventory – 1A (BDI – 1A)
	2) Psychotic experiences	2) Peters Delusion Inventory (PDI)
	3) Distress	3) Peters Delusion Inventory - Distress Subscale (PDI-D)
	4) Anxiety	4) Spielberger State-Trait Anxiety Inventory (SSTAI)
	5) Resilience	5) Connor-Davidson Resilience Scale (CD-RISC)
	6) Self compassion	6) Self Compassion Scale (SCS)
	7) Mindfulness	7) Five Facet Mindfulness Questionnaire (FFMQ)
	8) Empathy	8) Empathic Concern and Perspective Taking of the Interpersonal Reactivity Index (IRI)
	9) Positive and negative affect	9) Positive and Negative Affect Scale (PANAS)
Ascone (2017)	1) Paranoia	1) The Paranoia checklist
	2) Self-Compassion	2) The Self-Compassion scale (SCS)
	4) Self-Criticism and Self-Reassurance	4) The Forms of Self-Criticism and Reassurance Scale (FSCRS)
	5) Negative and Positive Affect	5) Stemmler, Heldmann, Pauls and Scherer Self-Report Items
Martins (2017)	1) Paranoia	1) The Paranoia Checklist
	2) Shame	2) Other as Shamer Scale
	3) Self Criticism	3) The Forms of Self-Criticism and Reassuring Scale (FSCRS)
	4) Psychological Acceptance & Avoidance	4) Acceptance and Action Questionnaire
	5) Mindfulness	5) Five Facets of Mindfulness Questionnaire (FFMQ)

First Author, Year	Outcome Variables	Outcome Measures Used
Mayhew (2008)	1) Auditory Hallucinations 2) Self-Criticism 3) Self-Compassion 4) General Symptomology, including Subscales of Depression, OCD, Anxiety, Paranoia, Psychoticism, Interpersonal Sensibility,	1) Voice Rank Scale Beliefs about Voices Questionnaire (BAVQ) Weekly Diary of Voice Activity 2) Forms of Self-criticism/ Self Attacking and Self-Reassuring Scale Functions of Self-Criticism/ Self Attacking Scale Weekly Diary of Self-Critical Thoughts 3) Weekly Diary of Self-Compassionate Thoughts Self-Compassion Scale (SCS) 4) Symptoms Checklist-90 (SCL-90)
Cheli (2020)	1) General symptomology 2) Depression, Anxiety & Stress	1) Symptom Checklist (SCL-90) 2) Depression, Anxiety and Stress Scale (DASS-21)
Forkert (2022)	1) Paranoia 2) Self compassion 3) Negative Believes about Self and Others Positive Thoughts about Self and Others 4) Self Esteem	1) Green et al. Paranoid Thoughts Scales (GPTS) 2) Self-Compassion Scale (SCS) 3) Brief Core Schema Scale (BCSS) 4) Rosenberg Self-Esteem Scale (RSE) Social Comparison Scale (SCS)

First Author, Year	Outcome Variables	Outcome Measures Used
Heriot Maitland (2025)	1) Social Safeness 2) Self Compassion 3) Social Comparison	1) Social Safeness and Pleasure Scale (SPSS) 2) Self-Compassion Scale Short-Form (SCSSF) 3) Social Comparison Scale (SCS)
Hickey (2020)	1) Depression, Anxiety & Stress 2) Self-Criticism 3) Distress related to Psychotic Experiences 4) Psychosis Symptoms 5) Self-Compassion 6) Mindfulness 7) Sociability	1) Depression, Anxiety, Stress Scale (DASS-21) 2) Forms of Self-Criticizing/ Attacking and Reassuring Scale 3) Comprehensive Assessment of the At-Risk Mental State (CAARMS) 4) Comprehensive Assessment of the At-Risk Mental State (CAARMS) Brief Psychiatric Rating Scale (BPRS) 5) Self Compassion Scale (SCS) Fears of Compassion Scale (FCS) 6) Five Facets of Mindfulness Questionnaire (FFMQ) 7) Global Functioning, Social (GF: Social) and Role (GF: Role) Scales Relationships Questionnaire (RQ)
Rivera (2023)	1) Worry 2) Depression, Anxiety & Stress 3) Positive and Negative Affect	1) Penn State Worry Questionnaire (PSWQ-11) 2) Depression, Anxiety, Stress Scale (DASS-21) 3) Positive and Negative Affect Scale (PANAS)

First Author, Year	Outcome Variables	Outcome Measures Used
	4) Self-esteem	4) Rosenberg Self-Esteem Measure (RSE)
	5) Wellbeing	5) Ryff Scales of Psychological Wellbeing
	6) Mindfulness	6) Five Facets of Mindfulness Questionnaire (FFMQ)
Laithwaite (2009)	1) Depression	1) Beck Depression Inventory (BDI)
	2) Self-Esteem	2) Rosenberg Self-Esteem Measure (RSE)
	3) Self Compassion	Social Comparison Scale (SCS)
	4) Shame	The Self-Image Profile for Adults (SIP-AD)
	5) General Psychopathology	3) Self Compassion Scale (SCS)
		4) The Other as Shamer Scale (OAS)
		5) The Positive and Negative Syndrome Scale (PANSS)
Burke (2020)	1) Anxiety	1) Spielberger State-Trait Anxiety Inventory (SSTAI)
	2) Depression	2) Beck Depression Inventory – 1A (BDI – 1A)
	3) Psychosis Symptoms	3) Peters Delusion Inventory (PDI)
	4) Distress	4) Peters Delusion Inventory, Distress Subscale (PDI-D)
	5) Self Compassion	5) Self Compassion Scale (SCS)
	6) Mindfulness	6) Five Facet Mindfulness Questionnaire (FFMQ)
	7) Mentalization	7) Interpersonal Reactivity Index (IRI), Empathetic Concern and Perspective Taking Subscales
	8) Social Motivation	8) Time Alone Questionnaire

First Author, Year	Outcome Variables	Outcome Measures Used
	9) Self-Efficacy	Social Network Index (SNI) 9) The General Self-Efficacy Scale (SES)
Khoury (2013)	1) Social Functioning	1) Social Functioning Scale (SFS)
	2) Emotional Self-Regulation	2) Cognitive Emotion Regulation Questionnaire (CERQ)
	3) Distress	3) The Psychological Distress Manifestation Measure (PDMM)
	4) Mindfulness	4) Freiburg Mindfulness Inventory (FMI), Short Version
	5) Cognitive Insight	5) Beck Cognitive Insight Scale (BCIS)
	6) Psychotic Symptoms	6) Brief Psychiatric Rating Scale (BPRS)
Lincoln (2013)	1) Paranoia	1) The Paranoia Checklist
	2) Depression	2) The Allgemeine Depressions Skala (The General Depression Scale) (ADS)
	3) Self-Esteem	3) Rosenberg Self Esteem Scale
	4) Emotional, Cognitive & Motivational States	4) Stemmler, Heldmann, Pauls and Scherer Self-Report Items
Rauschenberg (2021)	1) Psychosis Symptoms	1) Brief Symptom Inventory (BSI) Prodromal Questionnaire (PQ)
	2) Depression	
	3) Anxiety	2) Brief Symptom Inventory (BSI)
	4) Threat	3) Brief Symptom Inventory (BSI)

First Author, Year	Outcome Variables	Outcome Measures Used
	5) Paranoia	4) Threat Anticipation Measure (TAM) 5) Greens Paranoid Thoughts Scale (GPTS)
Martins (2018)	1) Social Functioning	1) The Personal and Social Performance Scale, Social Functioning Item
	2) Positive Symptoms	2) Positive and Negative Syndrome Scale, Positive Symptoms Subscale
	3) Negative Symptoms	3) Positive and Negative Syndrome Scale, Negative Symptoms Subscale
	4) Self-Compassion	4) Self-Compassion Scale, Positive Composite
	5) External Shame	5) Other as Shamer Scale
	6) Fears of Self-Compassion	6) Fear of Self-Compassion Scale, Fear of Self-Compassion Subscale
	7) Self-Reassurance and Self-Criticism	7) The Forms of Self-Criticism and Reassurance Scale (FSCRS)
Brown (2021)	1) Paranoia	1) Green Paranoid Thoughts Scale - Part B
	2) Self-Compassion	Visual Analogue Scales 2) Visual Analogue Scales

Note. Outcome measures have been ordered alongside the outcome variables. This represents what each outcome measure was measuring specifically.

Appendix F - Ethics Proposal Form

GO II Ethics application form – Psychology Committee

1. Applicant Details

1.1 Applicant name	Megan Hall
1.2 Supervisor	Dr Tess Maguire and Dr Amanda Woodrow
1.3 Other researchers / collaborators (if applicable): *Name, address, email*	Not applicable

2. Study Details

2.1 Title of study	The Mediating Role of Cognitive Theory of Mind between Developmental Trauma and Paranoia.
2.2 Type of project (e.g. undergraduate, Masters, Doctorate, staff)	Doctorate (DClinPsy)

2.3 Briefly describe the rationale for carrying out this project and its specific aims and objectives.
Previous research has largely investigated the relationships between the following variables, 1) developmental trauma and Theory of Mind (ToM) (Peterson et al., 2022), 2) developmental trauma and psychosis (Redman et al., 2017), and 3) ToM and psychosis (Bora et al., 2013). Current research is starting to investigate whether there is an interaction between the three variables, and specifically whether ToM has a mediating role between developmental trauma and psychotic experiences. Whilst preliminary findings have not supported this hypothesis (Monastra, 2018a), suggestions have been made to improve methodology within future research from a recent systematic review (Monastra, 2018b).

The main suggestion that the current study intends to implore within it's design, is to provide better definitions of the variables chosen and ensure they are more focused on specific experiences rather than much wider and variable concepts. For example, Monastra (2018) suggests measuring paranoia rather than broader psychosis-like experiences, and distinguishing between affective ToM (understanding the feelings and emotions of others) and cognitive ToM (understanding the thoughts and intentions of others). With previous research not making these distinctions and measuring several concepts under larger umbrella terms (e.g. 'theory of mind'), it is possible that relationships between the variables have been missed. By narrowing down these variables, it is hoped that different findings may be identified and that cognitive theory of mind may be found to have a mediating role in the relationship between developmental trauma and paranoia.

There is also a call for further research investigating the relationship between developmental trauma and cognitive ToM, with a systematic review highlighting only 12 previous studies with conflicting results (Benarous et al., 2005).

'Self-compassion' has been identified as an existing mediator in the relationship between some developmental traumas and paranoia (Richardson et al., 2023). More specifically, research has highlighted that the impact of trauma can be attenuated by higher levels of self-compassion; with lower levels of rumination, avoidance and shame identified within individuals who are more self-compassionate than those are less self-compassionate after developmental trauma (Winders, et al., 2020). Given this, the current study will use The Child Abuse and Trauma Scale (CATS; Sanders & Becker-Lausen, 1995), a subjective measure which asks the individuals about their perceptions of their experiences. Cognitive processes linked to lower self-compassion (such as those listed above) may influence answers on this questionnaire. Lastly, low self-compassion has also been linked with higher levels of paranoia (Collett et al., 2016). When considering the literature discussed above, it is important that self-compassion is controlled for in the current study design to reduce the chances of a type two error when looking at whether ToM mediates the relationship between developmental trauma and paranoia.

The current study aims to address the gaps in the above research, using recommendations to scaffold the methodology and measures chosen.

2.4 Provide a brief outline of the basic study design. Outline what approach is being used and why.

The proposed study consists of three online questionnaires, followed by an online reading task. A cross sectional design will be used within the proposed study, with all participants completing the same tasks in the same order. The study will be totally anonymous.

The variables for the study are as follows, developmental trauma (predictor variable), paranoia (outcome variable), Theory of Mind (potential mediating variable), self-compassion (confounding variable).

2.5 What are the key research question(s)? Specify hypotheses if applicable.

Research Question 1: Does developmental trauma predict poor cognitive Theory of Mind in a non-clinical population?

Hypothesis: We hypothesise that those who score higher on the developmental trauma measure will perform less well on the cognitive Theory of Mind task.

Research Question 2: Does cognitive Theory of Mind mediate the relationship between developmental trauma and paranoia in a non-clinical population?

Hypothesis: We hypothesise that cognitive Theory of Mind will mediate the relationship between developmental trauma and paranoia. Namely, participants who perform less well on the ToM task, will score higher on the developmental trauma and paranoia scales in comparison to individuals who perform well on the ToM task.

3. Sample and setting

3.1 Who are the proposed participants and where are they from (e.g. fellow students, club members)? List inclusion / exclusion criteria if applicable.

The proposed study will be completed within the general population. Participants must be aged between 18 – 65 and be fluent in the English language. Excluded from the study are individuals who 1) do not speak fluent English (due to the measures being written in the English language), 2) have acquired brain injury, 3) are addicted to illicit drugs or alcohol and would be either intoxicated or in withdrawal at the point of participation and, 4) have a mental health diagnosis relating to paranoia or psychosis.

Individuals who have an acquired brain injury or are addicted to illicit substance/ alcohol will be excluded from the study due to existing links with both variables and paranoia (Koponen et al., 2001; Haney & Evins, 2016), which would therefore not be representative of the effect of childhood experiences on Theory of Mind and paranoia. Individuals will be asked to self-exclude should they have an existing mental health diagnosis for several reasons detailed below.

Firstly, participants will be asked questions relating to developmental trauma via an online questionnaire. Whilst measures will be taken to reduce distress, we intend on recruiting a non-clinical sample to safeguard those with mental health diagnoses who may otherwise experience heightened distress when answering these questions. Secondly, should we include individuals from a clinical population, we would then need to ask whether participants were prescribed any psychotropic medication. This is because this medication may reduce current levels of paranoia, effecting answers provided on this scale, but would not necessarily impact ToM; therefore potentially impacting the observed relationship between these variables. Needing to ask and control for the effect of medication means more personal and sensitive information will be required from each participant which is not ethically sound when other adaptations can be made such as recruiting from a non-clinical sample only.

3.2. How will the participants be identified and approached? Provide an indication of your sample size. If participants are under the responsibility of others (e.g., parents/carers, teachers) state if you have permission or how you will obtain permission from the third party).

Participants will be recruited from the general population via posters around the university and using social media. The research will also be advertised in relevant open forums such as The Paranoia Network and SMARTERN (a student mental health research network) and special interest groups on Facebook and Reddit with the aim of allowing a wider disperse of answers within the paranoia measure to be obtained. In the aim of improving diversity within the sample and recruit individuals who may not be able to access social media, posters will also be put in any local areas with advertising boards, such as community centres and shops. This will also be explored with Patient and Public involvement (PPI) prior to the recruitment of participants to identify any other means of recruitment that will improve accessibility.

A G-power analysis has advised that a sample of 89 participants will be required for the below design. I aim to recruit approximately 120 participants to account for the removal of

participants due to missing data. This number was chosen after reading advice that when accounting for missing data, the study should factor in for at least an extra 18% of participants (Muthén & Muthén, 2002). Given the sensitive nature of some of the questions, it is possible that higher levels of missing data will be observed and therefore a slightly higher limit was set for the current study. Participation levels will be checked at regular intervals and the study will be closed once this limit has been reached to avoid over-recruiting. As this is cross sectional in design, I anticipate a low attrition rate given that it will be completed at only one time point.

3.3 Describe the relationship between researcher and sample. Describe any relationship e.g., teacher, friend, boss, clinician, etc.

There will be no known relationship between the researcher and the sample. However, the research will be advertised on social media so it is possible that people known to the researchers will choose to participate.

3.4 How will you obtain the consent of participants? (*please upload a copy of the consent form if obtaining written consent***) NB A separate consent form is not needed for online surveys where consent can be indicated by ticking/checking a consent box (normally at the end of the PIS). Other online study designs may still require a consent form or alternative procedure (for example, recorded verbal consent for online interviews).**

Participants will first read an information sheet and be asked to give their informed consent to take part in the study. Consent will be obtained via a tick box at the end of the participant information sheet prior to the study starting.

3.5 Is there any reason to believe participants may not be able to give full informed consent? If yes, what steps do you propose to take to safeguard their interests?

Not applicable.

4. Research procedures, interventions and measurements

4.1 Give a brief account of the procedure as experienced by the participant. Make it clear who does what, how many times and in what order. Make clear the role of all assistants and collaborators. Make clear the total demands made on participants, including time and travel. *Upload copies of questionnaires and interview schedules to ERGO.*

The study will be completed online via an anonymous link from Qualtrics. Participants will first read an information sheet and be asked to give their informed consent to take part in the study. Consent will be obtained via a tick box at the end of the participant information sheet prior to the study starting.

The researcher's email address will be provided at the end of the study along with the debrief sheet which will signpost them to appropriate support if necessary. Due to the study being online, participants have the potential to stop participating midway without informing the researcher by closing the window tab. To ensure all participants have been provided with the support lines, they will also be provided at the start of the study alongside the consent form.

Signposting will include:

1) Mind's information line to request information about local mental health services (0300 123 3393/ info@mind.org.uk)

2) The National Association for People Abused in Childhood (0808 801 0331/ support@napac.org.uk)

3) The Samaritans (116 123)

Demographics will be collected, including age, gender, ethnicity and whether the person is in full time education (given there is a possibility that a high percentage of participants may be students given the methods of recruitment documented above).

Participants will then complete the following measures.

1) Revised Green et al., Paranoid Thoughts Scale (R-GPTS)

The R-GPTS consists of 18 questions which ask participants to rank their experiences on a 1-5 Likert scale. The measure assesses the frequency of paranoid thoughts and constitutes of two different subscales, ideas of reference (Part A) and ideas of persecution (Part B). Both scales have

found to have high reliability and validity within both clinical and non-clinical populations and is readily available online alone with a scoring scales.

2) The Child Abuse and Trauma Scale (CATS; Sanders & Becker-Lausen, 1995)

This measure is a self-report, Likert scale which asks participants to answer 38 questions measuring traumatic experiences during developmental years (childhood and adolescence). Answers range from 1-5 with higher scores indicating higher levels of traumatic experiences. The measure includes three different subscales including, negative home atmosphere/neglect, sexual abuse and punishment. This measure will allow us to identify any traumatic experiences within the developmental period. It has good reliability and validity scores, is continuous in nature which is needed for the regression analysis and is readily available online.

3) Self-Compassion Scale-Short Form (SCS-SF; Raes et al., 2011)

A 12-item scale in which individuals answer questions on a 1-5 Likert scale relating to their experiences of self-compassion. This measure was chosen due it's relatively short nature (given the already lengthy other questionnaires chosen for the current design) and its reliability in a non-clinical sample (Cronbach's alpha = .83).

4) The Imposing Memory Task (Kindermann et al., 1998)

The Imposing Memory Task assesses Cognitive Theory of Mind, the ability to understand others thoughts and intentions. The participants will read five short stories which detail the experiences of up to four characters per story. The participants are then be asked 20 true or false questions after reading each story. 10 questions will ask them about the thoughts and intentions of the characters in the story, and the other 10 will ask factual questions to ensure the participant has understood the story. The story will not be accessible at the point of answering the questions and participants will be made aware of this prior to participating. Whilst the story is on the screen for participants to read, there will also be a sound clip which will read the story out loud, as per the original format of the measure (Kindermann et al., 1998).

Whilst the original IMT has been attached, researchers are considering updating some of the stories to make them more relevant to current times. If this is completed, it will be done so with public and participant involvement. An example of an updated story has been attached on a separate document. Researchers are also aware that this measure may be quite burdensome for participants due to it's complexity and length. Researchers have spoken to the professors who developed the

measure who confirmed that it would be appropriate to remove some factual questions if needed. We intend to speak about this within our PPI in addition to the proposed order of the tasks above.

Participants will not be able to move onto the next section of the study before answering all questions in all of the above measures, apart from the CATS. This is because researchers acknowledge that this measure is asking about more sensitive information than the other questionnaires and has the potential to cause some distress if participants are unable to move on. In the aim of reducing any participant distress, the questions in the CATS will be optional and participants will be able to proceed without answering any (or all) of the questions as desired.

4.2 Will the procedure involve deception of any sort? If yes, what is your justification?

Not applicable

4.3. Detail any possible (psychological or physical) discomfort, inconvenience, or distress that participants may experience, including after the study, and what precautions will be taken to minimise these risks.

It is possible that the CATS may cause psychological distress due to the questions relating to childhood trauma. Participants will be made aware of this prior to participating to the study and will therefore be aware of the nature of the questions beforehand.

The researcher's email address will be provided at the end of the study along with the debrief sheet which will signpost them to appropriate support if necessary. Due to the study being online, participants have the potential to stop participating midway without informing the researcher by closing the window tab. To ensure all participants have been provided with the support lines, they will also be provided at the start of the study alongside the consent form.

Signposting will include:

1) Mind's information line to request information about local mental health services (0300 123 3393/ info@mind.org.uk)

2) The National Association for People Abused in Childhood (0808 801 0331/ support@napac.org.uk)

3) The Samaritans (116 123)

4.4 Detail any possible (psychological or physical) discomfort, inconvenience, or distress that YOU as a researcher may experience, including after the study, and what precautions will be taken to minimise these risks. If the study involves lone working please state the risks and the procedures put in place to minimise these risks (please refer to the lone working policy).

It is unlikely that I will experience any risks due to the study being online. Should participants experience distress and wish to contact me, I may feel vicariously distressed after offering support. Should a participant contact me, I will speak to my supervisors first and in the instance I am distressed, will speak to them again afterwards.

4.5 Explain how you will care for any participants in 'special groups' e.g., those in a dependent relationship, are vulnerable or are lacking mental capacity), if applicable:

Not applicable due to the study being online in nature and this information not being collected/requested.

4.6 Please give details of any payments or incentives being used to recruit participants, if applicable:

A prize draw of six £50 Amazon vouchers will be used to encourage participation. To ensure that no personal information is collected alongside the responses to the measures below, a link to a separate survey will be provided at the end of the study. Participants will have the chance to follow the link and enter their email address to be entered into the prize. This information will never be linked or stored with the responses to the measures outlined below.

Researchers are aiming to get the proposed study registered on SONA, which would also allow 12 research credits will also be offered to any students at the university who take part in the study (6 credits for every 30 minutes).

5. Access and storage of data

5.1 How will participant confidentiality be maintained? Confidentiality is defined as non-disclosure of research information except to another authorised person. Confidential information can be shared with those already party to it and may also be disclosed where the person providing the information provides explicit consent. Consider whether it is truly possible to maintain a participant's involvement in the study confidential, e.g. can people observe the participant taking part in the study? How will data be anonymised to ensure participants' confidentiality?
The study will be anonymous with no identifiable information being requested. It is an online survey in which participants can complete in their own time, with no researcher or peers present.

5.2 How will personal data and study results be stored securely during and after the study. Who will have access to these data?
The data will initially be kept within Qualtrics once participants have completed the study. Following this, the data will be manually transferred into a password protected Excel spreadsheet which will be stored on main researcher's OneDrive. Following the completion of data collection, all data will made accessible to the public via the University Institutional repository in line with the Open Access Policy. All participants will be made aware of this prior to participation.

5.3 How will it be made clear to participants that they may withdraw consent to participate? Please note that anonymous data (e.g. anonymous questionnaires) cannot be withdrawn after they have been submitted. If there is a point up to which data can be withdrawn/destroyed e.g., up to interview data being transcribed please state this here.
Participants will not be able to remove their results from the study after submitting them. This will be made clear in the participant information sheet.

6. Additional Ethical considerations

6.1 Are there any additional ethical considerations or other information you feel may be relevant to this study?
Not applicable.

Appendix G Combined Participant Information Sheet and Consent Form

Study Title: The Mediating Role of Cognitive Theory of Mind between Developmental Trauma and Paranoia

Researcher(s): Megan Hall (DClinPsy student), Dr Tess Maguire and Dr Amanda Woodrow

University email: megan.hall@soton.ac.uk

Ethics/ERGO no: 92819

Version and date: V1, 25/03/2024

What is the research about?

My name is Megan Hall, and I am a second-year student completing the Doctorate in Clinical Psychology at the University of Southampton in the United Kingdom. I am inviting you to participate in a study looking into the relationship between childhood trauma, paranoia, self-compassion and Theory of Mind (the ability to understand other people's thoughts, feelings and intentions). Our research is interested specifically in whether Theory of Mind ability influences the relationship between childhood trauma and non-clinical paranoia in adults.

This study was approved by the Faculty Research Ethics Committee (FREC) at the University of Southampton (Ethics/ERGO Number: 92819).

What will happen to me if I take part?

This study will involve completing three short questionnaires, followed by a short task in which you will read a story and answer questions about what you have just read. This should take approximately one hour of your time. You will be unable to save your answers and complete any remaining questions should you exit the study. If you are happy to complete this survey, you will need to tick (check) the box below to show your consent. As this survey is anonymous, the research team will not be able to know whether you have participated, or what answers you provided. As the results will be unidentifiable, you will not be able to remove your results from the study after you have submitted them.

You will be provided with an optional link after completing the study which will take you to a new survey. This will ask you to provide your email address to be entered into the prize draw for 6 x £50 Amazon vouchers. Researchers will not be able to link your email address to the answers you provided in the surveys. You do not need to provide an email address if you do not wish, however, you will not be able to enter the draw in this instance.

Participant Eligibility

Thank you for registering interest to participate. The researchers have advertised this study online and via social media and therefore expect participants to be located across many different regions across the United Kingdom. Researchers are aiming to recruit around 120 participants for this study.

To participate in the study, you must meet the following criteria:

- be between 18 years and 65 years of age
- be fluent in the English language
- be able to use the internet to answer multiple choice questionnaires

If any of the below criteria are applicable to your circumstance, you will unfortunately not be able to take part in the study. Should you wish to discuss the rationale for this, please contact the researchers on the email addresses above.

- You have any known condition that may impact cognitive functioning (e.g., dementia, traumatic brain injury)
- You have a diagnosed mental health condition relating to psychosis or paranoia
- You are taking anti-psychotic medication (e.g., risperidone, olanzapine, clozapine)
- You are dependent on any illicit substances and would be unable to participate whilst not under the influence of drugs or alcohol

What information will be collected?

The questions in this survey will be in 5 different parts, however, will all be multiple choice in nature. The sections will be completed in the following order.

You will be asked:

1) for your demographic data including; age, gender, ethnicity and whether you are in full time education. You will also be asked to confirm you meet all of the eligibility criteria listed above.
2) to read 18 statements relating to paranoia and rank how applicable they each feel to your experiences on a 1-5 scale.

3) to read 38 statements relating to adverse or traumatic experiences you may have experienced growing up, and rank how applicable they each feel to your experiences on a 1-5 scale.
4) to read 12 statements relating to self-compassion and rate how applicable they each feel to your experiences.
5) to read 5 stories and answer 20 true or false questions after each story.
6) *optional* to follow a new link to input your contact details to enter the prize draw. There will also be a chance to tick whether you would like to receive a copy of the final report once it has been written up.

What are the possible benefits of taking part?

If you decide to take part in this study, you will have the opportunity to win one of 6 x £50 Amazon vouchers in a prize draw following completion of all questions. Additionally, your participation will contribute to knowledge in this area of research and will help develop an understanding of the relationship between childhood trauma, Theory of Mind and paranoia. This is important information as it may help clinicians to understand which therapeutic models are most relevant for specific clients.

Are there any risks involved?

There is a possibility that taking part in this study could cause you some psychological discomfort and/or distress due to the first survey asking about negative childhood experiences. However, the survey will not ask you to disclose any specific details about your experiences, and will instead ask you to respond using multiple options only. The measure will state 38 childhood experiences and ask you to rate them in accordance with your own childhood on a 0-4 scale (0 = never, 4 = always).

If you experience any psychological discomfort or do not wish to continue for any other reason, you can stop the survey at any time by clicking the cross in the top right corner. You can also contact the following resources for support should you wish:

1) Mind's information line to request information about local mental health services (0300 123 3393/ info@mind.org.uk)

2) The National Association for People Abused in Childhood (0808 801 0331/ support@napac.org.uk)

3) The Samaritans (116 123)

These details will be provided again following completion of the study; however, you may wish to take a copy of them now in case you decide to stop participation midway through the study where they will not be available.

What will happen to the information collected?

All information collected for this study will be stored securely on a password protected computer and backed up on a secure server. In addition, all data will be pooled and only compiled into data summaries or summary reports. Only the researcher and their supervisor will have access to this information.

The information collected will be analysed and written up as part of the researcher's thesis. It is hoped that the thesis will be published in a journal, with results presented at post graduate conferences.

The University of Southampton conducts research to the highest standards of ethics and research integrity. In accordance with our Research Data Management Policy, data will be held for 10 years after the study has finished when it will be securely destroyed.

What happens if there is a problem?

If you are unhappy about any aspect of this study and would like to make a formal complaint, you can contact the Head of Research Integrity and Governance, University of Southampton, on the following contact details: Email: rgoinfo@soton.ac.uk, phone: + 44 2380 595058.

Please quote the Ethics/ERGO number above. Please note that by making a complaint you might be no longer anonymous.

More information on your rights as a study participant is available via this link:
https://www.southampton.ac.uk/about/governance/participant-information.page

Thank you for reading this information sheet and considering taking part in this research.

☐ Please tick (check) this box to indicate that you have read and understood information on this form, are aged 18 or over and agree to take part in this survey.

Appendix H Debrief Information

Study Title: The Mediating Role of Cognitive Theory of Mind between Developmental Trauma and Paranoia

Ethics/ERGO number: 92819

Researcher(s): Megan Hall (DClinPsy student), Dr Tess Maguire and Dr Amanda Woodrow

University email: megan.hall@soton.ac.uk

Version and date: V1, 25/03/2024

Thank you for taking part in our research project. Your contribution is very valuable and greatly appreciated.

Purpose of the study

The aim of this research was to look at the relationship between childhood trauma, paranoia, self-compassion and Cognitive Theory of Mind (the ability to understand other people's thoughts and intentions). Our research was interested specifically in whether Cognitive Theory of Mind influences the relationship between childhood trauma and non-clinical paranoia in adults. Self-compassion has already been identified as having an effect on this relationship in previous studies. It was therefore included within the current study to ensure it can be controlled and not influence our results.

Based on results from existing literature, we expected that participants who experienced childhood trauma to score less highly on the Theory of Mind task and more highly on the paranoia questionnaire. Your data will help to develop our understanding of the relationship between childhood experiences, Theory of Mind and paranoia.

Confidentiality

Results of this study will not include your name or any other identifying characteristics.

Study results

If you would like to receive a copy of the final written report, please click on a link at the bottom of this form which will take you to a separate survey to collect your contact details. It is up to you whether you would like to receive study results. Please note that by providing your contact details, your participation in the study might be no longer anonymous, but researcher will not know what information you provided.

Further support

If taking part in this study has caused you discomfort or distress, you can contact the following organisations for support:

1) Mind's information line to request information about local mental health services (0300 123 3393/ info@mind.org.uk)

2) The National Association for People Abused in Childhood (0808 801 0331/ support@napac.org.uk)

3) The Samaritans (116 123)

Further reading

If you would like to learn more about this area of research, you can refer to the following resources:

1) Turner, R., Louie, K., Parvez, A., Modaffar, M., Rezaie, R., Greene, T., ... & Bloomfield, M. A. (2022). The effects of developmental trauma on theory of mind and its relationship to psychotic experiences: A behavioural study. Psychiatry Research, 312, 114544.

   https://www.sciencedirect.com/science/article/pii/S016517812200155X

2) Monastra, M. (2018). The Role of Affective Theory of Mind in the Association between Trauma and Psychotic-Like Experiences. Lancaster University (United Kingdom).

   https://www.proquest.com/docview/2164133958?pq-origsite=gscholar&fromopenview=true&sourcetype=Dissertations%20&%20Theses

Further information

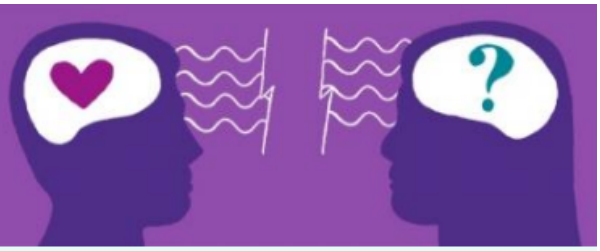
If you have any concerns or questions about this study, please contact Megan Hall at megan.hall@soton.ac.uk who will do their best to help.

If you remain unhappy or would like to make a formal complaint, please contact the Head of Research Integrity and Governance, University of Southampton, by emailing: rgoinfo@soton.ac.uk, or calling: + 44 2380 595058. Please quote the Ethics/ERGO number which can be found at the top of this form. Please note that if you participated in an anonymous survey, by making a complaint, you might be no longer anonymous.

Thank you again for your participation in this research.

Appendix I Recruitment Poster

University of Southampton



Participants wanted for an online study

investigating the relationship between childhood experiences, self compassion and the way we understand other people's thoughts, feelings and intentions.

Participants will be asked to:

1) Answer multiple choice questions about your childhood experiences, self-compassion and current thoughts about others
2) Read 5 short stories and answer true or false questions about them

Participation will take **approx. 1 hour** and is **completely anonymous.**

Are you?

- between 18 and 65 years of age
- fluent in the English language
- able to use the internet to answer multiple choice questions

Why Participate?

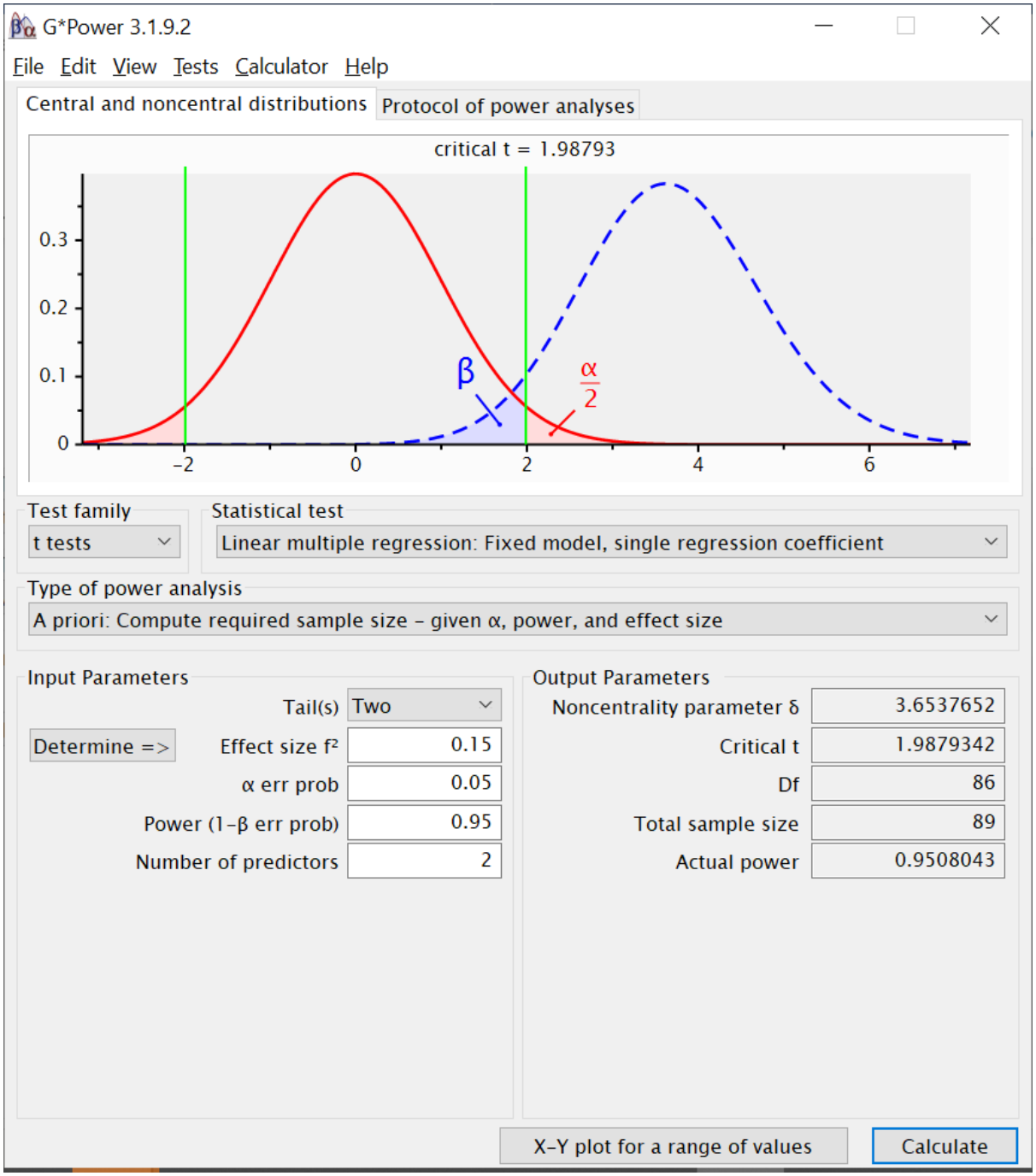
For the chance **win one of 6 x £50 Amazon Vouchers** and contribute to current psychological knowledge

To participate, scan the QR code, or contact megan.hall@soton.ac.uk

This research is funded by The University of Southampton and has been ethically approved. ERGO number: 92819

Research Team: *Megan Hall (DClinPsy Student), Dr Tess Maguire and Dr Amanda Woodrow*

Appendix J - G Power Analysis



Appendix K Revised Greens Paranoid Thoughts Scale

R-GPTS - Worries about others

Part A

Name: _____

Date: _____

Please read each of the statements carefully. They refer to thoughts and feelings you may have had about others over the last month.

Think about the last month and indicate the extent of these feelings from 0 (Not at all) to 4 (Totally).

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

	Not at all		Somewhat		Totally
1. I spent time thinking about friends gossiping about me.	0	1	2	3	4
2. I often heard people referring to me.	0	1	2	3	4
3. I have been upset by friends and colleagues judging me critically.	0	1	2	3	4
4. People definitely laughed at me behind my back.	0	1	2	3	4
5. I have been thinking a lot about people avoiding me.	0	1	2	3	4
6. People have been dropping hints for me.	0	1	2	3	4
7. I believed that certain people were not what they seemed.	0	1	2	3	4
8. People talking about me behind my back upset me.	0	1	2	3	4

R-GPTS - Worries about others

Part B

Name: _____

Date: _____

Please read each of the statements carefully. They refer to thoughts and feelings you may have had about others over the last month.

Think about the last month and indicate the extent of these feelings from 0 (Not at all) to 4 (Totally).

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

		Not at all		Somewhat		Totally
1.	Certain individuals have had it in for me.	0	1	2	3	4
2.	People wanted me to feel threatened, so they stared at me.	0	1	2	3	4
3.	I was certain people did things in order to annoy me.	0	1	2	3	4
4.	I was convinced there was a conspiracy against me.	0	1	2	3	4
5.	I was sure someone wanted to hurt me.	0	1	2	3	4
6.	I couldn't stop thinking about people wanting to confuse me.	0	1	2	3	4
7.	I was distressed by being persecuted.	0	1	2	3	4
8.	It was difficult to stop thinking about people wanting to make me feel bad.	0	1	2	3	4
9	People have been hostile towards me on purpose.	0	1	2	3	4
10	I was angry that someone wanted to hurt me.	0	1	2	3	4

Appendix L Child Abuse and Trauma Scale

3 = very often
4 = always

To illustrate, here is a hypothetical question:

Did your parents criticize you when you were young?		0 1 2 3 4

If you were rarely criticized, you should circle number 1.

Please answer all the questions.

	1. Did your parents ridicule you?	0 1 2 3 4
NEG	2. Did you ever seek outside help or guidance because of problems in your home?	0 1 2 3 4
NEG	3. Did your parents verbally abuse each other?	0 1 2 3 4
PUN	4. Were you expected to follow a strict code of behavior in your home?	0 1 2 3 4
R-PUN	5. When you were punished as a child or teenager, did you understand the reason you were punished?	0 1 2 3 4
PUN	6. When you didn't follow the rules of the house, how often were you severely punished?	0 1 2 3 4
NEG	7. As a child did you feel unwanted or emotionally neglected?	0 1 2 3 4
	8. Did your parents insult you or call you names?	0 1 2 3 4
SA	9. Before you were 14, did you engage in any sexual activity with an adult?	0 1 2 3 4
NEG	10. Were your parents unhappy with each other?	0 1 2 3 4
NEG	11. Were your parents unwilling to attend any of your school-related activities?	0 1 2 3 4
	12. As a child were you punished in unusual ways (e.g., being locked in a closet for a long time or being tied up)?	0 1 2 3 4
SA	13. Were there traumatic or upsetting sexual experiences when you were a child or teenager that you couldn't speak to adults about?	0 1 2 3 4
NEG	14. Did you every think you wanted to leave your family and live with another family?	0 1 2 3 4
SA	15. Did you ever witness the sexual mistreatment of another family member?	0 1 2 3 4
NEG	16. Did you ever think seriously about running away from home?	0 1 2 3 4
	17. Did you witness the physical mistreatment of another family member?	0 1 2 3 4
R-PUN	18. When you were punished as a child or teenager, did you feel the punishment was deserved?	0 1 2 3 4
NEG	19. As a child or teenager, did you feel disliked by either of your parents?	0 1 2 3 4
	20. How often did your parents get really angry with you?	0 1 2 3 4
	21. As a child did you feel that your home was charged with the possibility of unpredictable physical violence?	0 1 2 3 4
R	22. Did you feel comfortable bringing friends home to visit?	0 1 2 3 4
R	23. Did you feel safe living at home?	0 1 2 3 4
R-PUN	24. When you were punished as a child or teenager, did you feel "the punishment fit the crime"?	0 1 2 3 4
	25. Did your parents ever verbally lash out at you when you did not expect it?	0 1 2 3 4
SA	26. Did you have traumatic sexual experiences as a child or teenager?	0 1 2 3 4
NEG	27. Were you lonely as a child?	0 1 2 3 4
	28. Did your parents yell at you?	0 1 2 3 4
SA	29. When either of your parents was intoxicated, were you ever afraid of being sexually mistreated?	0 1 2 3 4
NEG	30. Did you every wish for a friend to share your life?	0 1 2 3 4
NEG	31. How often were you left at home alone as a child?	0 1 2 3 4
	32. Did your parents blame you for things you didn't do?	0 1 2 3 4
NEG	33. To what extent did either of your parents drink heavily or abuse drugs?	0 1 2 3 4
PUN	34. Did your parents ever hit or beat you when you did not expect it?	0 1 2 3 4
SA	35. Did your relationship with your parents ever involve a sexual experience?	0 1 2 3 4
NEG	36. As a child, did you have to take care of yourself before you were old enough?	0 1 2 3 4
	37. Were you physically mistreated as a child or teenager?	0 1 2 3 4
NEG	38. Was your childhood stressful?	0 1 2 3 4

Appendix M Self-Compassion Scale - Short Form (SCS–SF)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

Almost never				Almost always
1	2	3	4	5

_____1. When I fail at something important to me I become consumed by feelings of inadequacy.

_____2. I try to be understanding and patient towards those aspects of my personality I don't like.

_____3. When something painful happens I try to take a balanced view of the situation.

_____4. When I'm feeling down, I tend to feel like most other people are probably happier than I am.

_____5. I try to see my failings as part of the human condition.

_____6. When I'm going through a very hard time, I give myself the caring and tenderness I need.

_____7. When something upsets me I try to keep my emotions in balance.

_____8. When I fail at something that's important to me, I tend to feel alone in my failure

_____9. When I'm feeling down I tend to obsess and fixate on everything that's wrong.

_____10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.

_____11. I'm disapproving and judgmental about my own flaws and inadequacies.

_____12. I'm intolerant and impatient towards those aspects of my personality I don't like.

Appendix N Original Imposing Memory Task

STORY 1

WHERE'S THE POST OFFICE?

Sam wanted to find a Post Office so he could buy a Tax Disc for his car. He was already late buying one, as his Tax Disc had run out the week before. Because traffic wardens regularly patrolled the street where he lived, he was worried about being caught with his car untaxed. As Sam was new to the area, he asked his colleague Henry if he could tell him where to get one. Henry told him that he thought there was a Post Office in Elm Street. When Sam got to Elm Street, he found it was closed. A notice on the door said that the Post Office had moved to new premises in Bold Street. So Sam went to Bold Street. But by the time he got there, the Post Office had already closed. Sam wondered if Henry, who was the office prankster, had deliberately sent him on a wild goose chase. When he got back to the office, he asked another colleague, Pete, whether he thought it likely that Henry had deliberately misled him. Pete thought that, since Sam had been anxious about the Tax Disc, it was unlikely that Henry would have deliberately tried to get him into trouble.

Story 1: Where's the Post Office

Please answer TRUE (√) or FALSE (X) to each of the questions that follow each story.

		Type	Level	Truth
1. Sam left Bold Street, then went to the office and spoke to Pete	Fact	3+1	True	
2. Pete, who worked at the same place as Henry the office prankster, was Sam's cousin, which is why Sam asked Pete how to find the post office		Fact	5+1	False
3. Henry thought that Sam knew he was a prankster		Ment	3	False
4. Henry knew Sam believed he knew the Post Office's location		Ment	3	True
5. Sam thought that Henry knew the Post Office was in Bold Street and hence that Henry must have intended to mislead Sam		Ment	5	True
6. Sam believed that Pete thought the Post Office was in Elm Street and hence that Pete must not have intended to mislead Sam		Ment	5	True
7. Sam needed to buy a stamp		Fact	1+1	False
8. Pete wanted Sam to know that Henry believed that the Post Office was on Elm Street and hence did not intend to mislead him		Ment	6	True
9. The Post Office was closed, and Sam's insurance had run out		Fact	2+1	False
10. Pete wanted Sam to know that he believed that Henry had intended not to mislead him		Ment	6	True
11. Sam bought a Tax Disc from the Post office		Fact	1+1	False
12. The Post Office was closed		Fact	1+1	True
13. Henry wanted to play a trick		Ment	2	False
Sam asked Henry, and did not ask Pete where the Post Office was in order to buy a Tax Disk		Fact	4+1	True
14. Sam found the Post Office closed and couldn't buy a tax disk for Pete		Fact	3+1	False
15. Sam thought Henry knew he wanted a Tax Disk		Ment	4	False
16. Sam who worked with Pete and Henry did not know where to buy a Tax Disk because he was new to the area		Fact	4+1	True
17. Henry, the man that Sam, who was new to the area, spoke to about where to buy a Tax Disk because his had run out, was a colleague of Pete's		Fact	5	True
18. The Post Office in Elm St. had a notice on the door		Fact	2+1	True
19. Pete suspected that Henry intended to play a prank on Sam		Ment	3	False

STORY 2

JOHN'S PROBLEM

It was nearly the end of the day, and John thought it might be nice to go to the pub for a drink after work. At first, he wasn't sure whom he should ask to go with him. He very much wanted to ask Sheila, whom he fancied, but he thought that she didn't like him enough to be willing to give up her aerobics class to go drinking with him. He could, of course ask Pete, his usual drinking companion. Then he happened to see Penny. He knew that Penny was one of Sheila's friends. She would know whether Sheila would be willing to go out for a drink with him. "Listen Penny," he said, "I thought I might go for a drink after work. I was wondering whether you and Sheila would like to come too. Would you ask Sheila whether she would like to go for a drink with us?" Penny looked surprised. John had never asked her to go out with him before, but she knew that he was very keen on Sheila. She began to suspect that John wanted to find out whether she knew what Sheila might want to do.

Story 2: John's Problem

Please answer TRUE (√) or FALSE (X) to each of the questions that follow each story.

	Type	Level	Truth
1. John always asks Penny to go drinking with him and Pete	Fact	3+1	False
2. Penny thinks Pete hopes that Sheila will have a drink with him	Ment	4	False
3. Penny suspected that John wanted to know whether Penny knew if Sheila would like to go for a drink with him	Ment	5	True
4. John knew that Pete would understand not being asked for a drink, because Pete knew that John fancied Sheila	Ment	5	False
5. Sheila asked Penny to go for a drink	Fact	2+1	False
6. John didn't ask Pete to go for a drink	Fact	2+1	True
7. Sheila believed that John knew she was busy and so he had intended to invite Penny out alone, but because he didn't want Sheila to feel left out, so instead said he wanted both women to come	Ment	6	False
8. Penny knew that John was keen on Sheila, so she suspected that John wanted to find out whether she knew what Sheila might want to do	Ment	6	True
9. Penny usually went for a drink after work	Fact	2+1	False
10. Pete worked with Penny and Sheila	Fact	2+1	True
11. Sheila, who works with John and Penny, goes to an aerobics class every day after work and doesn't usually go drinking	Fact	4+1	True
12. Penny thought that Sheila wouldn't want to go for a drink with him	Ment	3	False
13. John knows that Sheila likes aerobics	Ment	3	True
14. Pete, the man that John usually went drinking with after work, was not asked out because John asked Penny and Sheila instead	Fact	5+1	True
15. John wanted to go for a drink after work	Ment	2	True
16. John wants to go out with Jenny	Ment	2	False
17. Sheila spoke to Penny but did not speak to Pete or John about giving up her aerobics class because she knew she would be late at the pub	Fact	4+1	False
18. John, who worked with Sheila, asked Penny and Sheila out for a drink, even though he usually went drinking with Pete, was keen on Penny	Fact	5+1	False
19. John didn't ask Pete or Sheila to go drinking after work	Fact	3+1	True
20. John thought Penny knew what Sheila wanted to do	Ment	4	True

STORY 3

EMMA'S DILEMMA

Emma worked in a greengrocer. She wanted to persuade her boss to give her an increase in wages. So, she asked her friend Jenny, who was still at school, what she should say to the boss. "Tell him that the chemist near where you live wants you to work in her shop." Jenny suggested. "The boss won't want to lose you, so he will give you more money" she said. So, when Emma went to see her boss, that is what she told him that she would take a job at the chemists nearer her home if he did not pay her more. Her boss thought that Emma might be telling a lie, so he said he would think about it. Later, he went to the chemist's shop near Emma's house and asked the chemist whether she had offered a job to Emma. The chemist said she hadn't offered Emma a job. The next day the boss told Emma that he wouldn't give her an increase in wages, and she was welcome to take the job at the chemist's instead if that was what she wanted to do.

Story 3: Emma's Dilemma

Please answer TRUE (√) or FALSE (X) to each of the questions that follow each story.

	Type	Level	Truth
1. Emma was offered a job at the bank	Fact	1+1	False
2. The greengrocer asked Jenny if Emma had been offered a job	Fact	3+1	False
3. Emma thought her boss knew the chemist hadn't wanted to give her a job	Ment	3+1	False
4. Jenny thought that Emma's boss would believe that Emma would like to work for the chemist who wanted Emma to work for her	Ment	5	True
5. Jenny went to see the chemist about offering Emma a job	Fact	2+1	False
6. Emma worked at a chemist near where she lived	Fact	2+1	False
7. Jenny thought that Emma's boss would think that the chemist, who allegedly wanted Emma to come and work, thought that Emma should be paid more	Ment	5	True
8. Jenny wanted Emma to get a higher wage	Ment	2	True
9. Jenny who was Emma's friend and from whom Emma asked advice, was a career girl	Fact	4	False
10. Emma worked at a greengrocer, but her friend Jenny (who was still at school) worked at the chemist's whom Emma asked if she could have a job	Fact	4+1	False
11. The greengrocer, who was Emma's boss and paid her a low wage, went to speak to the chemist after Emma spoke to him about the chemist's job in order to check whether she had been offered a job	Fact	5+1	True
12. The chemist knew about Emma's story	Ment	2	False
13. Emma believed that Jenny hoped that her boss would believe Emma's claim about the chemist wanting to offer her a job	Ment	6	True
14. Jenny asked the chemist if she had offered a job to Emma, who worked at the post office	Fact	3+1	False
15. Jenny hoped the greengrocer believed the chemist had wanted to give Emma a job `	Ment	4	True
16. Jenny knew that Emma was unhappy with her wages so she believed that if she got Emma's boss to think that the chemist wanted Emma to go and work there, he would believe her	Ment	6	True
17. Emma's boss believed that the chemist wanted to give her a job	Ment	3	True
18. Jenny thought Emma's boss would believe the story	Ment	3	True
19. Emma, who worked at the greengrocer's shop and lived near the chemist, asked Jenny, her friend, , for advice on what to do about her grades	Fact	5+1	False
20. Emma's boss is the greengrocer	Fact	1+1	True

STORY 4

SIMON THINKS….

Simon was 19 years old and worked as a mechanic. His cousin, Jim, was quite a lot older, and worked as a milkman. Because Jim had to get up early in the morning, he seldom went out in the evening. As a result, Jim's social life was a bit restricted. Jim and his best friend Edward had known each other since primary school; they had been inseparable when they were younger. Edward worked in a bank, and therefore had more opportunity to go out in the evenings. Simon knew that Jim wanted to marry Susan. Simon also knew that Jim believed that Susan wanted to marry Edward, and that Jim was concerned that Susan found Edward socially more exciting because he could take her out in the evenings. Simon thought that if he could convince Jim that Susan believed that Edward wanted to marry another girl named Betty (even though Betty did not actually want to marry Edward), Jim might be persuaded that Susan would say "Yes", if he asked her to marry him. So Simon planned to have a drink with Jim one lunchtime when they were both free, and tell him this.

Story 4: Simon thinks

Please answer TRUE (√) or FALSE (X) to each of the questions that follow each story.

	Type	Level	Truth
1. Simon knew that Jim believed that Simon thought Edward was more socially appealing, and that Susan thought Jim was boring	Ment	5	False
2. Edward went to primary school with Simon's cousin, whose name was Jim	Fact	3+1	True
3. Jim's cousin is 20 years old	Fact	1+1	False
4. Simon wants Jim to believe that Edward fancies Betty	Ment	4	True
5. Jim wants to marry Susan	Ment	2	True
6. Simon wants to take Jim out for a drink	Ment	2	True
7. Simon imagined that Betty wanted to marry Edward but that Edward really wanted to marry Susan, whom Jim would like to have married	Ment	5	False
8. Jim and Edward have been friends since school	Fact	1+1	True
9. Simon hoped that Jim would believe that Edward wanted to marry Betty because Simon wanted to make Jim happy by thinking he had a chance with Susan	Ment	6	True
10. Jim, who is Simon's cousin, often goes out with Susan when he goes to the cinema	Fact	3+1	False
11. Edward, who was a friend of Jim's, worked at a bank, and had time to go out at night, unlike Jim who worked as a milkman and couldn't socialize at night	Fact	5+1	True
12. Jim believes Susan thinks that Edward works as a milkman	Ment	3	False
13. Simon wants Jim to know that Susan thought that he wanted to marry her and that she would like to marry him also	Ment	6	True
14. Simon is Jim's cousin and is a mechanic	Fact	2+1	True
15. Simon knows his cousin wants to marry Susan	Ment	3	True
16. Jim, who is Edward's friend, doesn't have much of a social life because he works as a milkman and doesn't get out in the evenings	Fact	4+1	True
17. Edward, who works in a bank and has plenty of spare time, was friends with Jim but had never met Susan	Fact	4+1	False
18. Jim is older than Simon and is a banker	Fact	2+1	False
19. Jim thinks that Susan wants to marry Edward	Ment	3	True
20. Simon, who was Jim's brother and who worked as a mechanic, was 19 yrs old, which was a lot younger than Jim who didn't socialize much	Fact	5+1	False

STORY 5

CLIVE and LUCY

It was Clive and Lucy's wedding anniversary; they had been married for one year. Lucy thought that Clive might have forgotten and was surprised when he took her out to a restaurant for dinner. Clive was pleased that she had been surprised. They sat at a table beside a window overlooking the harbour. There was a candle in a wine bottle on the table, and the tablecloth was a deep red in colour. The waiter came to take their orders, but Clive said he had not yet made up his mind. He continued to stare at the menu for a quite a length of time. Lucy had already made up her mind and said she wanted the monkfish and also ordered a side dish of salad. After a few minutes, Lucy started to wonder why Clive was taking so long to choose what he wanted. She thought it might be because the food was very expensive. She began to feel upset because that might spoil their evening. Clive noticed that she was upset, but didn't know why. 'I've noticed that there is only seafood on the menu. You know I don't like seafood. I'll see if they have a vegetarian option instead' he explained. Lucy seemed relieved, but Clive still didn't know what had upset her.

Story 5: Clive and Lucy

Please answer TRUE (√) or FALSE (X) to each of the questions that follow each story.

		Type	Level	Truth
1.	Lucy ordered monkfish and chips	Fact	1+1	False
2.	Lucy knew that Clive regretted that Lucy was feeling angry because Clive did not know what to eat	Ment	5	False
3.	The expensive restaurant that Clive booked only sold seafood	Fact	3+1	True
4.	Clive thought that Lucy understood that he didn't like seafood	Ment	4	True
5.	Clive booked a restaurant to celebrate their 2nd wedding anniversary	Fact	3+1	False
6.	Clive thought Lucy was upset because he didn't like seafood	Ment	3+1	True
7.	When the waiter came to the table, Lucy ordered the monkfish; but Clive had not selected anything, so he eventually ordered a vegetarian dish	Fact	4+1	True
8.	Lucy was worried that Clive believed she didn't like the restaurant	Ment	4	False
9.	The restaurant only served vegetarian food	Fact	1+1	False
10.	Clive wanted a vegetarian option	Ment	2	True
11.	While having lunch at a seafood restaurant, Clive perused the menu for a vegetarian option while Lucy ordered monkfish, but did not order a salad	Fact	5+1	False
12.	Lucy wanted Clive to know that she thought that Clive believed the restaurant was too expensive	Ment	5	False
13.	Clive thought that Lucy believed that Clive knew that Lucy thought that Clive felt that the food was too expensive	Ment	6	false
14.	Lucy ordered the monkfish and salad, Clive ordered nothing	Fact	2+1	True
15.	Lucy thought Clive was worried about the price	Ment	3	True
16.	Lucy knew Clive had remembered their anniversary	Ment	3	False
17.	Clive and Lucy sat at a table beside the window which overlooked the harbour; there was a candle in a wine bottle sitting on their table	Fact	4+1	True
18.	Lucy thought the food was too rich	Ment	2	False
19.	The restaurant that Clive booked to celebrate their anniversary had the table with a deep red tablecloth and candle in a wine bottle, and it was beside a window and overlooked the harbour,	Fact	5	True
20.	Clive booked a restaurant to celebrate their anniversary	Fact	2+1	True

Appendix O - Imposing Memory Task (Updated)

You will soon read five short stories. After each story, you will be asked 20 questions about what you have just read. You will not be able to return to the story after you have started the questions, please read the story twice and take your time before moving onto the questions.

Please answer TRUE or FALSE to each of the questions that follow the stories. If the question asks for information that is not easily inferred through your reading of the story, please indicate your answer as being false, DO NOT GUESS.

You will not be able to return to any questions to change your answer once you have clicked 'next', please go with your instinct and work through the questions as quickly as possible.

STORY 1

Seb wanted to find the admin team to update his parking permit for the office car park. He was already late updating it and his permit had run out the week before. Because traffic wardens regularly patrolled the street where he worked, he was worried about getting a parking ticket. As the office space was fairly new, Seb asked his colleague Henry if he knew where the admin team were based. Henry told him that he thought the admin team were on the third floor. When Seb got to the third floor, nobody was there. A notice on the door said that the admin had moved to a new room on the top floor. Seb went to top floor, but by the time he got there, the admin team had gone home. Seb wondered if Henry, who was the office prankster, had deliberately sent him on a wild goose chase. When he got back to his desk, he asked another colleague, Yasmin, whether she thought Henry had deliberately misled him. Yasmin thought that, since Seb had been anxious about the permit, it was unlikely that Henry would have deliberately tried to get him into trouble.

QUESTIONS (AND SCORING) FOR STORY 1

Question	Type (Fact or Mentalisation)	Level	True/False
1. Seb left the top floor, then went to his desk and spoke to Yasmin	Fact	4	True
2. Yasmin, who worked at the same place as Henry the office prankster, was Seb's cousin, which is why Seb asked Yasmin where to find the admin team	Fact	6	False
3. Henry thought that Seb knew he was a prankster	Ment	3	False
4. Henry knew Seb believed he knew where the admin team were based	Ment	3	True
5. Seb thought that Henry knew the admin team were on the top floor and that Henry must have intended to mislead Seb	Ment	5	True
6. Seb believed that Yasmin thought the admin team were on the third floor and hence that Yasmin must not have intended to mislead Seb	Ment	5	True
7. Seb needed to get a new name badge	Fact	2	False

8. Yasmin wanted Seb to know that Henry believed that the admin team were on the third floor and did not intend to mislead him	Ment	6	True
9. The admin team had gone home and Seb's insurance had run out	Fact	3	False
10. Yasmin wanted Seb to know that she believed that Henry had intended not to mislead him	Ment	6	True
11. Yasmin wanted to play a trick	Ment	2	False
12. Seb thought Henry knew he needed to update his parking permit	Ment	4	False
13. Seb who worked with Yasmin and Henry did not know where to update his parking permit because the office space was fairly new	Fact	5	True
14. Yasmin suspected that Henry intended to play a prank on Seb	Ment	3	False

STORY 2

It was nearly the end of the day, and Joe thought it might be nice to go to the pub for a drink after work. At first, he wasn't sure who he should ask to go with him. He very much wanted to ask Katie, the girl he fancied, but he thought that she didn't like him enough to cancel her evening yoga class to go drinking with him. He could, of course ask Matt, his usual drinking companion. Then he happened to bump into Shirin, one of Katie's friends. She would know whether Katie would be willing to go out for a drink with him. "Hey Shirin," he said, "I was thinking about going for a drink after work. I was wondering whether you and Katie would like to come too. Would you ask Katie if she'd like to go for a drink with us?" Shirin looked surprised. Joe had never asked her to go out with him before, but she knew that he really liked Katie. She began to suspect that Joe wanted to find out whether she knew what Katie might want to do.

QUESTIONS (AND SCORING) FOR STORY 2

Question	Type (Fact or Mentalisation)	Level	True/False
1. Joe always asks Shirin to go drinking with him and Matt	Fact	4	False
2. Shirin thinks Matt hopes that Katie will have a drink with him	Ment	4	False
3. Shirin suspected that Joe wanted to know whether Shirin knew if Katie would like to go for a drink with him	Ment	5	True
4. Joe knew that Matt would understand not being asked for a drink, because Matt knew that Joe fancied Katie	Ment	5	False
5. Katie asked Shirin to go for a drink	Fact	3	False
6. Katie believed that Joe knew she was busy and so he had intended to invite Shirin out alone, but because he didn't want Katie to feel left out, so instead said he wanted both women to come	Ment	6	False
7. Shirin knew that Joe was keen on Katie, so she suspected that Joe wanted to find out whether she knew what Katie might want to do	Ment	6	True

8. Matt worked with Katie and Shirin	Fact	3	True
9. Katie, who works with Joe and Shirin, goes to a yoga class after work and doesn't usually go drinking	Fact	5	True
10. Shirin thought that Katie wouldn't want to go for a drink with him	Ment	3	False
11. Joe knows that Katie likes yoga	Ment	3	True
12. Matt, the man that Joe usually went drinking with after work, was not asked out because Joe asked Katie and Shirin instead	Fact	6	True
13. Joe wanted to go for a drink after work	Ment	2	True
14. Joe wants to go out with Shirin	Ment	2	False
15. Joe thought Shirin knew what Katie wanted to do	Ment	4	True

STORY 3

Emma worked in a local supermarket. She was struggling financially and wanted to ask her boss, the supermarket owner, for a pay rise. She asked her friend Laura, who was still at school, what she should say to her boss. "Tell him that you have been offered a job at the hairdressers near your house that pays more money" Laura suggested. "The boss doesn't want to lose you, so he will give you more money" she said. When Emma went to see her boss, she informed him she had been offered a job at the hairdressers and said she would leave if he did not give her a pay rise. Her boss thought that Emma might be lying, so said he needed to think about it. Later, he went to the hairdressers near Emma's house and asked whether somebody had offered a job to Emma. The hairdresser said they did not have any jobs available and that this was not the case. The next day, the boss told Emma that he would not give her a pay rise, and she was welcome to take the job at the hairdressers if she wanted.

QUESTIONS (AND SCORING) FOR STORY 3

	Question	Type (Fact or Mentalisation)	Level	True/False
1.	The boss asked Laura if Emma had been offered a job	Fact	4	False
2.	Emma thought her boss knew the hairdresser hadn't wanted to give her a job	Ment	3+ 1	False
3.	Laura thought that Emma's boss would believe that Emma would like to work for the hairdresser who wanted Emma to work for her	Ment	5	True
4.	Emma worked at a hairdresser near where she lived	Fact	3	False
5.	Laura thought that Emma's boss would think that the hairdresser, who allegedly had offered Emma a job, thought that Emma should be paid more	Ment	5	True
6.	Laura wanted Emma to get a higher wage	Ment	2	True
7.	Emma worked in a supermarket, but her friend Laura (who was still at school) worked at the hairdressers where Emma asked if she could have a job	Fact	5	False

8. The supermarket owner, who was Emma's boss and paid her a low wage, went to speak to the hairdresser after Emma spoke to him in order to check whether she had been offered a job	Fact	6	True
9. The hairdresser knew about Emma's story	Ment	2	False
10. Emma believed that Laura hoped that her boss would believe Emma's claim about the hairdresser wanting to offer her a job	Ment	6	True
11. Laura hoped the supermarket owner believed the hairdressers had wanted to give Emma a job	Ment	4	True
12. Laura knew that Emma was unhappy with her wages so she believed that if she got Emma's boss to think that the hairdresser wanted Emma to go and work there, he would believe her	Ment	6	True
13. Emma's boss believed that the hairdresser wanted to give her a job	Ment	3	True
14. Laura thought Emma's boss would believe the story	Ment	3	True
15. Emma's boss is the supermarket owner	Fact	2	True

STORY 4

Khari was 19 years old and worked as a mechanic. His cousin, Luke, was quite a lot older, and worked in a factory. Because Luke had to get up early in the morning for his shift, he rarely went out in the evening. As a result, Luke's social life was a bit restricted. Luke and his best friend Rhys had known each other since primary school; they were inseparable when they were younger. Rhys worked in a school and was able to go out more easily in the evenings. Khari knew that Luke wanted to date Grace. Khari also knew that Luke believed that Grace wanted to date Rhys, and that Luke was worried that Grace found Rhys more exciting because he could take her out in the evenings. Khari thought that if he could convince Luke that Grace believed that Rhys wanted to date another girl named Roxy (even though Roxy did not actually want to date Rhys), Luke might be persuaded that Grace would say "Yes", if he asked her on a date. So, Khari planned to have a drink with Luke one lunchtime when they were both free to tell him.

QUESTIONS (AND SCORING) FOR STORY 4

	Question	Type (Fact or Mentalisation)	Level	True/False
1.	Khari knew that Luke believed that Khari thought Rhys was more socially appealing, and that Grace thought Luke was boring	Ment	5	False
2.	Rhys went to primary school with Khari's cousin, whose name was Luke	Fact	4	True
3.	Luke's cousin is 20 years old	Fact	2	False
4.	Khari wants Luke to believe that Rhys fancies Roxy	Ment	4	True
5.	Luke wants to date Grace	Ment	2	True
6.	Khari wants to take Luke out for a drink	Ment	2	True
7.	Khari imagined that Grace wanted to date Rhys but that Rhys really wanted to date Grace, whom Luke would like to have dated	Ment	5	False

8. Khari hoped that Luke would believe that Rhys wanted to date Roxy because Khari wanted to make Luke happy by thinking he had a chance with Grace	Ment	6	True
9. Rhys, who was a friend of Luke's, worked at a school, and had time to go out at night, unlike Luke who worked in a factory and couldn't socialize at night	Fact	6	True
10. Luke believes Grace thinks that Rhys works in a factory	Ment	3	False
11. Khari wants Luke to know that Grace thought that he wanted to date her and that she would like to date him also	Ment	6	True
12. Khari knows his cousin wants to date Grace	Ment	3	True
13. Luke, who is Rhys' friend, doesn't have much of a social life because he works in a factory and doesn't get out in the evenings	Fact	5	True
14. Luke is older than Rhys and works in a school	Fact	3	False
15. Luke thinks that Grace wants to marry Rhys	Ment	3	True

STORY 5

It was Mani and Samira's first wedding anniversary. Samira thought that Mani might have forgotten and was surprised when he took her out to a restaurant for dinner. Mani was pleased that she had been surprised. They sat at a table beside a window overlooking the River Thames. There was a candle in a wine bottle on the table, with a white tablecloth underneath. The waiter came to take their orders, but Mani said he had not made up his mind yet. He continued to stare at the menu for quite some time. Samira had already made up her mind and ordered fish fritters with a side salad. After a few minutes, Samira started to wonder why Mani was taking so long to choose what he wanted. She thought it might be because the food was very expensive. She began to feel upset because that might ruin their evening. Mani noticed that she was upset, but didn't know why. 'You know I won't be able to eat a lot of this, the meat is not halal. I'll see if they have a vegetarian option instead' he explained. Samira seemed relieved, but Mani still didn't know what had upset her.

QUESTIONS (AND SCORING) FOR STORY 5

	Question	Type (Fact or Mentalisation)	Level	True/False
1.	Samira ordered fish fritters and rice	Fact	2	False
2.	Samira knew that Mani regretted that Samira was feeling angry because Mani did not know what to eat	Ment	5	False
3.	Mani thought that Samira understood that he could only eat halal meat	Ment	4	True
4.	Mani booked a restaurant to celebrate their 2nd wedding anniversary	Fact	4	False
5.	Mani thought Samira was upset because he could not eat non halal meat	Ment	3+1	True
6.	Samira was worried that Mani believed she didn't like the restaurant	Ment	4	False
7.	Mani wanted a vegetarian option	Ment	2	True

8. While having lunch at a seafood restaurant, Mani searched the menu for a vegetarian option while Samira ordered fish fritters, but did not order a salad	Fact	6	False
9. Samira wanted Mani to know that she thought that Mani believed the restaurant was too expensive	Ment	5	False
10. Mani thought that Samira believed that Mani knew that Samira thought that Mani felt that the food was too expensive	Ment	6	False
11. Samira thought Mani was worried about the price	Ment	3	True
12. Samira knew Mani had remembered their anniversary	Ment	3	False
13. Mani and Samira sat at a table beside the window which overlooked the River Thames; there was a candle in a wine bottle sitting on their table	Fact	5	True
14. Samira thought the food was too bland	Ment	2	False
15. Mani booked a restaurant to celebrate their anniversary	Fact	3	True

Appendix P Feedback Provided by Participant and Public Involvement Group

General Introduction Questions

Question	Feedback	Action Required?
How did you find completing the study?	1 = I found it ok. 2 = Yes, I enjoyed it. 3 = Really straightforward.	N/A
Was the study clear and did it make sense? Was there anything that was not clear?	1 = All straightforward, knew what I was supposed to be doing. 2 = All made sense, all very clear. 3 = Really explained well, always knew what I was supposed to do. Thought 'that was easy' in the introduction part.	N/A
Is there anything you would recommend that we should be aware of?	1 = Some of the scales are confusing. Very rare or all the time (it explains that from a 0-4, questions say 1-5) 2 = I found it hard to remember the first story (of the IMT), didn't realize it would need so much concentration. Later 4 stories were much better once I was in the swing of it. Maybe need to have it in red text as there is already a lot of bold and underlined text.	1 = Likert scales were confusing, however, changing the words may invalidate them. No action for this. 2 = Look at the instructions for the IMT and ensure they are formatted well in 'preview' mode of Qualtrics. 3 = Add a question asking whether participants completed the study on their phone or laptop. This will allow us to complete potential exploratory analyses to compare results.

	'Somebody had it in for me' in the trauma questionnaire. Didn't like that, I wonder if there was another phrase or word that might be better. Likert scales, some are different to others. When there is an inconsistency, it makes it harder to just answer truthfully, when it is all formatted the same then people don't have to think about this and can get into the survey more. 3 = Nothing, all good.	
Is there anything that you liked found interesting about the study?	1 = Unsure. 2 = Self-compassion was a nice touch, made me think about what is important to me. It did make me wonder how honest people would be, but I think the number of questions is helpful, it made me get into it properly and drop my walls. 3 = Was intrigued about the study, thought provoking questions and made me think hard.	N/A

Questions relating to Overall Participation Experience

Question	Feedback	Action Required?

Did you take part on a desktop or a phone? (ask 1 member of PPI to use their phone)	1 = Laptop 2 = Phone 3 = Laptop	N/A
How did you find the size of the font, amount of text etc.?	1 = All fine. First part overwhelming but all necessary so needed to be included. Flowed well. ERGO number missing on one page. 2 = Seemed fine, can read all 5 points with the (Likert) answers. Seems like a lot of text at the start. Text size ok, accessibility on a phone is good, nicely laid out. 3 = All fine, only thing is the stories in the IMT questions. Quite complicated and needed re-reading a few times.	N/A Although information is heavily loaded at the start, this is a university requirement.
How long did it take you to finish the study?	1 = 1 hour 10 minutes 2 = 30 minutes ish 3 = 35 minutes	N/A
What did you think about the length of time the study took to complete?	1 = It was fine. 2 = Yes, all fine for me, I expected it to be quite long so this could be relative to that. Have you put it on the poster?	1= Check length of time is on the info sheet at the start

	3 = Really good length, wasn't too long or too short.	
Did you notice any changes in your concentration at any point in the study?	1 = It got noticeably more wordy towards the end but I made sure I concentrated more to make sure I got it correct. 2 = Yes peak concentration between story 2-3, dipped after this throughout story 4 and particularly the last one. Story 4 I didn't understand but maybe this was my concentration. Could you have a story after each section (measure) to break them up? 3 = Story 4 required much more concentration, and I probably found this harder to follow. Story 5 was ok again.	1 = Take out 50% of the factual questions as per Dunbar's email and PPI feedback 2 = Interesting that story 4 was identified as most difficult as it is not harder according to scoring. After discussion, we will keep it in to ensure there are no ceiling effects. Consider looking at different scores of each story after data collection for differences.
Do you think this influenced your ability to answer the questions to the best of your ability?	1 = No because I read it twice and listened. 2 = It didn't influence my ability, but it really decreased my motivation. Just wanted it to be over and made me care less about getting it right. Halfway through story 5 just wanted to skip through, I didn't skip any but I REALLY tried to focus early on and this did change. Although counteracting this, I was getting better towards	See box above

	the end probably as I was making sure to take notes on the names etc. I felt a responsibility to keep trying because I was helping you and being paid, not sure how I would feel if not. 3 = Story 4 was most difficult, felt too long. But concentration was not affected.	

Questions Relating to Participant Distress

Question	Feedback	Action Required?
Was it clear what you could do, if you found participating in the study distressing and you needed support?	1 = Yes, it was clear in the start bit. 2 = Not to me. Perhaps I was skimming the information to get to the meat of the survey. Lots of information to be scrolling on the phone. Can you put the information in red or put it in a big box? Or some asterisks? Could add it in between each measure as part of the page break with a question asking 'do you feel ok to continue?' 3 = Yes, I saw it and noted it. Very clear.	1 = Include a signposting prompt after the trauma questionnaire. Look on 'preview' to identify whether this should a new page or put at the end of the CATS.
How was the order of the tasks for you?	1 = The order broke you into it quite easily. Stories need more	N/A

	concentration, so it is good they were at the end. 2 = Good, no comments here. 3 = Quite a good way of laying it out. I thought it was straightforward and didn't need any changes at all.	

Questions specifically to The Revised IMT

Question	Feedback	Action Required?
Was the content within the stories of the Imposing Memory Task ok to follow (not the questions)?	1 = Yes, all fine. 2 = Yes, no issues once I realized I had to memorize them. 3 = Yes, all good and very different. Liked that they were all different and some of them felt relatable.	N/A
How did you find listening to the stories and reading them?	1 = Fine, easy to listen to. Nice and clear. Nice to have audio as there was a lot of information. 2 = Just listened to them the first time. Then after that I read them and listened which was better.	N/A

	3 = Read it and listened the first time, then read alone again once. Quite enough time.	
Were the recordings ok in quality etc?	1 = Soundcheck 2 had no sound, other than that was all clear. 2 = Yes, fine after the sounds were changed onto SoundCloud. Before this the website crashed and I could not hear the sounds or finish the survey. 3 = Yes, really clear.	1 = Sounds readded via SoundCloud to rectify sound issues.
Did the sound play automatically for each of the stories?	1 = Yes 2 = Yes they did. 3 = Yes	N/A
Did you remember that you could not go back to the story after the questions? Or would a reminder at the bottom of each story have been helpful?	1 = It did stick in my mind, but it would be helpful to have it for others so they realize they have to memorize it. 2 = Yes, that would be helpful. I didn't realise and tried to go back. 3 = Yes this was obvious and I knew that.	1 = Add reminder at the bottom of each story.
What did you think of the timing on the IMT stories, 90 seconds before moving on. How was that for you?	1 = Didn't notice, didn't realise that was a thing.	1 = Can we record the time participants spent reading the stories? We can then report a minimum and maximum

	2 = It's fine. The sound bar moving across the bottom of the screen is helpful. Can you replay the sound? This would increase accessibility if people want that as different people take in information differently. It may be helpful, people are used to watching TikTok's and listening to sounds instead of reading stories. 3 = Perfect timing, listened and read twice.	time along with the overall mean.

Questions relating to Recruitment and Final Comments

Question	Feedback	Action Required?
Do you have any other comments about how you found participating in the study?	1 = No other feedback, all worked well. Did what it said on the tin. 2 = Pages are bland and uninspiring, it felt like a university page. For most people that isn't an issue, but for some others, may associate this with maturity.	1 = Add a progress bar which will help show how far participants are in the study. 2 = Considered shading alternate lines on Qualtrics to break up the

	So much black and white screen and text without any respite. Could have a 'well done' or 'thanks' in between each task to increase interaction. It lets people know that you are with them and are still considering them. Or, could you put unicorns or confetti on the screen? I use this in my work and it gives people a hit of something different to take you out of the monotony. 3 = No all good.	screen, however, this was not possible.
What did you think about the participant recruitment poster?	1 = Make 'participants wanted' bigger. 'Inclusion criteria' in a bigger font. Make the incentive bigger and in a different colour to make it stand out more, 'Participants will be asked to', is not left aligned properly in the text box. 2 = Alright. The formatting isn't amazing, the bar at the top isn't centre aligned. Lots of green. Too much text. You could hire someone in and give them the brief, a graphic designer would help. Feels dated. I'm not sure it would stand out on a wall of posters, but it does have all of the information you need on it. 3 = Really good, well laid out. I loved the colour scheme. Explained well	1 = University of Southampton logo add on 2 = Format poster as per feedback.

	about what the study was about. All very clear.	
Do you have any ideas on how we can recruit participants to maximize the chances of recruiting a wide diversity of participants and make the research more accessible?	1 = - contact different businesses, universities, colleges - contact elderly care homes - social media - notice boards in waiting rooms of local doctors and dentists etc. 2 = social media. This is where everyone is, meet people where they are and give them what they want. May need a video clip though to get people in, you could make one. 3 = Asking around friends of friends, putting it online would be best.	N/A

Appendix Q Acknowledgement of the Use of Artificial Intelligence

I acknowledge the use of ChatGPT (https://chatgpt.com/) to ensure in text references were in APA format, to proofread for spelling mistakes, and to count how many words were included in the systematic review without the in-text references. Whilst Chat GPT did produce an answer regarding the word count of the systematic review, this was vastly inaccurate and the word count produced was in fact longer than the overall wordcount provided by Microsoft Word. For this reason, ChatGPT's answer was disregarded, and the word count was instead estimated (as discussed in Appendix A). This declaration has been made in line with The University of Southampton's policy for the use of Artificial Intelligence within academic work (https://library.soton.ac.uk/sash/generative-ai).