

**RELATIONSHIPS AMONGST SELF-COMPASSION,
SELF-ESTEEM AND SCHIZOTYPY**

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Abstract

Aims and Objectives

The primary aim of the research was to investigate the nature of the relationships between self-compassion, self-esteem and schizotypy using a non-clinical sample. A secondary aim was to investigate the mechanisms which help to explain any relationships found. In utilising a non-clinical sample the study aimed to determine whether relationships exist between the variables prior to the onset of psychosis within a continuum approach to schizotypy. A final objective was to identify specific correlates of self-compassion and schizotypy through detailed subscale analyses.

Method

The study utilised a quantitative, cross-sectional design. Participants completed self-report questionnaires via a secure website host measuring: self-compassion, global self-esteem, and trait schizotypy. A total of 93 participants took part in the research.

Results

As predicted, highly significant negative correlations were determined between self-compassion and schizotypy, and between self-esteem and schizotypy. With respect to the mechanisms through which these variables were related, self-compassion was not found to moderate the relationship between self-esteem and schizotypy. However, self-compassion and schizotypy were found to be related via both a direct and an indirect route, which was mediated by self-esteem.

Conclusions

The study is the first to investigate the nature of the relationships amongst self-compassion, self-esteem and schizotypy in a non-clinical population, utilising the schizotypy construct as an analogue of the psychosis continuum. The findings indicated that there may be both a direct, and an indirect route through self-esteem,

which accounted for the relationship between self-compassion and schizotypy. The results mirror associations determined within clinical populations. The authors argues that in utilising schizotypy as an analogue of the psychosis continuum the results of this study provide evidence that self-esteem and self-compassion may reflect underlying mechanisms which could underpin schizotypal symptomatology.

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1.1 Overview

The main aim of the study is to investigate the relationships between self-compassion, self-esteem and psychotic-like symptomatology utilising the schizotypy construct. In this way the author sought to synthesise the literature in this area and provide guidance for future research. A secondary aim was to determine what mechanisms may govern the relationships that self-esteem and self-compassion have with schizotypy.

The first chapter will focus on providing an overview of current literature delineating factors relevant to schizotypy, self-compassion and self-esteem. Within each subsection there is a definition of the terms. Epidemiology and aetiological frameworks are also discussed for each of the constructs. The emphasis is upon psychological models of understanding, which form the basis of psychological interventions and treatment modalities. The relationships amongst the constructs are set within the research literature and finally the section ends with an overview of this literature, outlining gaps in current knowledge and thereby providing a rationale for the research aims and hypotheses.

1.2 Schizotypy

1.2.2 Definitions of schizotypy. The schizotypy construct is best described as a personality trait that includes a range of psychotic-like experiences (Esterberg & Comptom, 2009). There is considerable debate in the literature regarding the relative strengths and weaknesses of taxonomic versus fully-dimensional approaches to understanding schizotypy. A taxonomic understanding of schizotypy; also known as the quasi-dimensional approach, construes schizotypal symptomatology as a personality factor specifically found in around 10% of the population (Meehl, 1990 as cited in Lenzenweger, 2006). Meehl describes this small group of individuals as having

neurocognitive deficits which put them at risk of developing schizophrenia. The approach is based upon a disease model in which individuals either possess the genetic vulnerability to schizophrenia or not. The presence of neurocognitive deficits inherent in schizotypes are considered to be necessary but sufficient for the development of schizophrenia (Meehl, 1962, as cited in Lenzenweger, 2006). Within such a model of understanding environmental stressors interact with the underlying neurocognitive vulnerabilities to confer a lifetime risk towards the development of psychosis. In contrast researchers who endorse a fully-dimensional approach to schizotypy view the construct as a continuous dimension akin to other personality traits such as extraversion (Claridge & Beech 1995). Although this approach recognises the continuity of schizotypal symptoms within the general population it does not imply continuity of schizophrenia or SPD within the population at large. Individuals low in schizotypal traits can be considered to be 'healthy' i.e. do not present with any dysfunction. Indeed presence of schizotypal features has been associated with adaptive outcomes such as increased creativity and religiosity (McCreery & Claridge, 2002). Instead the approach recognises that high levels of schizotypy, in combination with other aetiological risk factors, confer risk to psychosis (Rawlings, Williams, Haslam & Claridge, 2008). The evidence for these different approaches is outlined in a later section.

Schizotypal symptomatology entered the Diagnostic and Statistical Manual of Mental Disorders-IV (DSM-IV; American Psychiatric Association, 2000) under the label of Schizotypal Personality Disorder (SPD), which is defined as;

...a pervasive pattern of social and interpersonal deficits marked by acute discomfort with, and reduced capacity for, close relationships as well as by cognitive or perceptual distortions and eccentricities of behaviour, beginning by early adulthood and present in a variety of contexts. (APA, 2000).

Fundamental similarities have been shown to exist in the underlying factor-analytical structure of both psychosis and schizotypy (Bentall, Claridge & Slade, 1989).

What follows are definitions of the types of symptoms which characterise the schizotypy construct.

1.2.1.1 Types of symptoms. Factor analyses of the schizotypy construct often result in three-factor solutions (Bentall et al., 1989). The three factors relate to (i) cognitive-perceptual symptoms (analogous to positive symptomatology in psychosis e.g. perceptual aberrations); (ii) interpersonal factors (analogous to negative symptomatology in psychosis e.g. social withdrawal); and (iii) disorganisation (e.g. odd behaviour and cognitions). In this way the three-factor solution of schizotypy is phenomenologically similar to the DSM-IV criteria of psychotic disorders (APA, 2000).

1.2.1.1.1 Cognitive-perceptual symptoms. Akin to the positive symptoms of psychosis, cognitive-perceptual aberrations are defined as distortions or exaggerations of normal functioning. They are considered as milder forms of the positive symptoms of psychosis (Bentall et al., 1989). They include symptoms such as magical thinking (analogous to delusional beliefs) and hallucinatory experiences.

Magical thinking includes beliefs that are culturally unacceptable, fixed and highly resistant to change even in the face of strong evidence against them. They are often highly idiosyncratic (Colman, 2012). Where an individual experiences a perception in the absence of a stimulus, which has the qualities of a tangible perception, this is labelled a hallucination. Hallucinatory experiences can affect any sensory modality, thus leading to the experience of auditory, gustatory, olfactory, visual and tactile hallucinations (Bentall, 2003).

1.2.1.1.2 Interpersonal symptoms. Akin to the negative symptoms of psychosis, the interpersonal symptoms in schizotypy are characterised by restrictions in the range

and intensity of emotional expression (blunted or flat affect), loss of ability to feel pleasure (anhedonia) and reductions in the initiation of goal-directed behaviour (avolition). Other symptoms include extreme discomfort in maintaining close relationships and social withdrawal (APA, 2000).

1.2.1.1.3 Disorganisational symptoms. Individuals expressing the disorganisation subtype of schizotypal phenomena exhibit an inability to express coherent logical thoughts, perhaps making tangential links between subjects. Distortions of behaviour can lead to seemingly eccentric behaviours, but which subjectively feel normal to the individual.

1.2.1.2 Quasi-dimensional versus fully-dimensional approaches. As previously outlined the two main conceptualisations of schizotypy are the quasi-dimensional (Meehl, 1962) and the fully-dimensional models (Claridge & Beech, 1995). Within a quasi-dimensional model individuals expressing the schizotypal phenotype are all considered to be at risk for the development of psychosis; within the context of necessary environmental aetiological factors. Alternatively those who subscribe to a fully-dimensional model suggest that the presence of schizotypal traits is not necessarily indicative of psychopathology. Indeed within this model only high schizotypes are considered at risk of decompensation to schizophrenia, and even then only in combination with other risk factors. In all other regards schizotypy is considered neutral with respect to psychopathology (Rawlings et al., 2008). Such individuals expressing schizotypal symptomatology in the absence of dysfunction are described by Eysenck and Eysenck (1976) as ‘healthy schizotypes.’ The evidence for these differing approaches is evaluated next.

1.2.1.2.1 Quasi-dimensional approach. The main strands of evidence in support of the quasi-dimensional approach are: epidemiological data including twin/ familial

studies (Fanous et al., 2007; Kendler, McGuire, Gruenberg & Walsh, 1993; Kendler, Thacker, & Walsh, 1996, Torgersen, 1984) and data from taxometric analyses (Rawlings et al., 2008; Waller & Meehl, 1998 as cited in Nelson, Seal, Pantelis & Philip, 2013).

1.2.1.2.1.1 Epidemiological data. Evidence from twin studies, particularly in those raised apart, suggests the prevalence of schizotypal traits among non-help-seeking, first-degree, adult relatives of schizophrenia patients is estimated to be between 14.6% (Pogue-Geile, 2003; Tsuang, Stone, & Faraone, 1999) and 48% (Beauchaine, Lenzenweger & Waller, 2008). According to Meehl's (1962) original theory the increased prevalence rates of schizotypy in psychosis probands is what would be expected among individuals selected for genetic vulnerability (Beauchaine et al., 2008).

Twin studies have also contributed molecular genetic data (Fanous et al., 2007) in support of the quasi-dimensional approach. Fanous et al. utilised a sample of 270 families where at least two members were diagnosed with a psychotic illness. The research hypothesis stated that there would be genetic markers linking schizotypy and schizophrenia, which would be more similar than would be expected by chance. Their hypothesis was upheld given that a range of aggregated genes were found to be significantly correlated between the two groups. The authors concluded that their research added further support towards schizotypal traits being genetically continuous with schizophrenia.

1.2.1.2.1.2 Cognitive markers. Other evidence in support of the quasi-dimensional view comes from data in which cognitive markers of psychosis; such as latent inhibition and negative priming, have been investigated. The rationale being that certain features of schizophrenia should be identifiable, even in a reduced form, in those

considered to be at risk of psychosis i.e. individuals possessing the schizotypal genotype. Within clinical psychosis populations Frith (1979) argues that there is a failure to 'limit the contents of consciousness due to a weakening of the inhibitory selective mechanisms taking part in information processing' (Frith, 1979). This leads to unstructured and intrusive sensory input. Subsequent doubt regarding the source of such experiences gives rise to anomalous experiences which could be labelled psychotic (Hemsley, 1993). Some researchers demonstrate this association within individuals expressing the schizotypal genotype (Williams et al., 1998 as cited in Beauchaine et al., 2008); however, others have found no such association between reduced latent inhibition and schizotypy. That is non-clinical schizotypes do not necessarily behave in the same manner as clinical populations in these experimental paradigms (Claridge, 1997; Beech & Claridge, 1987). Although the researchers conclude this is evidence in support of differing processes delineating psychosis and schizotypy, others argue that this may represent research design issues, or that the differing effects may be the result of processes associated with disease process itself (Williams et al., 1998 as cited in Beauchaine et al., 2008).

1.2.1.2.2 Fully-dimensional approach. The fully-dimensional approach is consistent with a view in which there is a 'healthy' schizotypy separable from those high-scoring schizotypes which are at increased risk of developing psychosis. As was noted in quasi-dimensional approaches, high schizotypy itself is necessary but not sufficient to confer risk of decompensation. Within the fully-dimensional approach environmental stressors are also thought to have a role in this process. Much of the evidence in support of this view comes from the high incidence rates of schizotypal symptomatology within non-clinical populations (in the absence of psychopathology), similar patterns of cognitive markers found between high-scoring schizotypes and

psychotic populations, and longitudinal data. Further to this, methodological issues associated with quasi-dimensional approach have also been posited as evidence that refutes the quasi-dimensional approach.

1.2.1.2.2.1 Non-help-seeking epidemiology. In a study utilising data from the National Institute of Mental Health (NIMH), Tien (1991, as cited in Rawlings et al., 2008) found rates of visual hallucinations in a non-help-seeking sample to be around 2%. Much higher rates were determined in a study by Romme, Honig, Noorthoorn, and Escher (1992). Of the 173 participants in their study who endorsed auditory hallucinations 76 were not in psychiatric care. Further to this, studies using student populations have consistently found high rates of auditory and visual hallucinations for which the participants had not sought psychiatric care (Johns, Nazroo, Bebbington, & Kuipers, 1998; Ohayon, 2000 as cited in Johns & van Os, 2001). Within longitudinal studies, discussed in a later section, there is evidence that even where participants are followed up for long periods such individuals remain functionally well and psychopathology-free (Yung et al., 2003)

1.2.1.2.2.2 Methodological issues. Much of the literature has concentrated upon the properties of 'positive' or cognitive-perceptual schizotypal experiences. Some suggest that evidence in support of the quasi-dimensional approach is diminished as a result of this bias. In fact within two reviews of the literature Rawlings, et al. (2008) and Tarboxa and Pogue-Geilea (2011) similarly concluded that there was little evidence in support of the quasi-dimensional properties of negative and cognitive disorganisation schizotypal symptomatology. Rawlings, et al. went further in their conclusions demonstrating that of the 18 studies in their review only two provided robust data in support of a quasi-dimensional approach, with a further two providing inconclusive data. What is clear, particularly from longitudinal studies, is that not all persons

experiencing subclinical schizotypal symptoms make transition to psychosis (e.g. Klosterkotte, et al., 2006; Morrison, 2002).

Rawlings et al. (2008) also suggest that scores on schizotypy measures often result in a significant positive skew. The authors suggest that within research endorsing a quasi-dimensional approach this issue is often not adequately addressed. This results in inaccurate conclusions in favour of the quasi-dimensional model being made due to the reliance upon extreme scores.

1.2.1.2.2.3 Cognitive markers. Advances in brain imagery techniques and neurocognitive testing have demonstrated similar patterns of cognitive deficits to be present in both those presenting with high schizotypy, SPD and psychosis (Beech et al., 1989; Liddle & Morris, 1991; Sellen, Oaksford & Gray, 2005; Steel, Mahmood, & Holmes, 2008; Steel, Fowler & Holmes, 2005). On the whole these cognitive deficits lie within the executive processes and affect regulation: the inhibition of inappropriate responses, Theory of Mind (ToM), and reasoning biases such as increased likelihood of jumping to conclusions (Liddle & Morris, 1991; Sellen et al., 2005). Moreover, similar deficits in the manner in which memories are encoded and subsequently stored (reduced contextual integration) have been demonstrated in high schizotypes (Holmes & Steel, 2004; Steel, Mahmood & Holmes, 2008), as is a propensity towards heightened threat monitoring (Freeman et al., 2011; Green & Philips, 2004) and emotional dysregulation (Lewandowski et al., 2006).

1.2.1.2.2.3.1 Theory of Mind. Theory of Mind (ToM) refers to the ability of an individual to accurately represent their own and other's mental states (Frith, 1992). Frith (1992) has argued that ToM impairments, demonstrated in individuals with psychosis, can lead to misrepresentations of one's own and other's intentions. In this way, false beliefs (delusions) relating to these intentions can be formed. Where

individuals perceive discrepancies between their own intentions and actions they are likely to seek explanations that may include culturally unacceptable views. Furthermore, social cues are often neglected, misunderstood, or overlooked by individuals demonstrating ToM deficits. The resulting communication breakdown is theorised to lead to cognitive distortions such as thought disorder. Utilising a community non-clinical sample of 62 individuals Pickup (2006) sought to investigate the presence of ToM deficits in high scoring schizotypes. Participants were administered a set of ToM stories and estimates of general reasoning ability were made using other tasks. Participants also completed the Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason & Claridge, 1995), which is a widely utilised self-report measure of trait schizotypy. The results demonstrated that participants scoring highly on the unusual experiences subscale of the O-LIFE, which is representative of positive schizotypal experiences, were associated with ToM deficits. This association was determined independently from general reasoning ability. However, total O-LIFE scores were not found to be associated with ToM deficits. This finding was also replicated elsewhere using a picture sequencing ToM task (Langdon & Colthart, 1999). Others have demonstrated poorer ToM in community samples of adolescents who score highly on self-report measures of psychotic-like experiences, and where depressive symptoms are controlled for (Barragan, Laurens, Navarro & Obiols, 2011). These findings are suggestive of a robust correlation between poor ToM and, in particular, higher scores on the positive subscales of schizotypy. However, the tasks employed in the measurement of ToM vary within the literature, and could indicate that only specific aspects of ToM demonstrate this effect.

1.2.1.2.2.3.2 Contextual integration. Contextual integration is a cognitive process affecting the way memories are encoded and subsequently recalled. Under

normal conditions autobiographical events, are encoded into memory through integration with previous experience in similar contexts (Broadbent, 1977, as cited in Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001). As a result, it is proposed that autobiographical memories are less likely to be involuntarily recalled because they are encoded within a meaningful spatial and temporal context (Conway, 1997 as cited in Garety et al., 2001). However, a quicker route to encoding also exists, which circumvents contextual binding in the hippocampus, instead opting for a more direct route to processing via the amygdala. When memories are encoded via an amygdala-only route they are highly affective, lack coherent integration within a spatial and temporal context and are experienced as intrusions. When such intrusions are misinterpreted as coming from an external source, or are given a culturally unacceptable meaning (Morrison, 2001), they are labelled as psychotic.

Where a fully-dimensional approach to schizotypy is endorsed similar patterns of reduced contextual integration would be expected within high-scoring schizotypes as are found in clinical populations (Garety et al., 2001). Two studies have investigated the nature of the relationship between high schizotypy and contextual integration (Holmes & Steel, 2004; Steel, et al., 2008). The first demonstrated that individuals scoring highly in schizotypy exhibited a baseline weakness in contextual integration, which was further reduced under conditions of induced stress (Holmes & Steel, 2004). Elsewhere Steel et al. (2008) found high-scoring schizotypes demonstrated reduced contextual integration during exposure to a real-life traumatic incident (road traffic accidents). As such there is certainly some evidence of similar information processing deficits (reduced contextual integration) being present in both psychotic and non-clinical (high-schizotypes) populations.

1.2.1.2.2.3.3 Heightened threat monitoring. Biases in threat detection have been related to the development of delusional beliefs, particularly paranoia, both within both non-clinical groups (Freeman et al., 2011) and those diagnosed with psychosis (Garety et al., 2001). Heightened sensitivity is demonstrated both in a pre-attentive bias for detection of threat (Freeman et al., 2011) and in difficulty disengaging from threat-related material which is in conscious awareness (Green, Williams & Davidson, 2003). Within psychosis populations Garety et al. (2001) suggest that a greater propensity towards threat detection maintains a sense of current threat, which in turn leads to biases in cognitive processing. In this way, individuals with heightened threat sensitivity focus their attention upon the detection of threat at the expense of taking in other aspects of their environment. Similarly Green, Williams and Davidson (2003) utilised a non-clinical population scoring highly in delusional beliefs, and found that they demonstrated behaviours associated with heightened threat monitoring. Specifically those in the high-delusional beliefs versus the low delusional-beliefs group spent more time scanning visually-presented faces representing fear and anger than they did happy faces. They also demonstrated extended scan-paths (distance between fixations on the face) on fearful and angry faces. This result may reflect hypervigilance towards processing threatening stimuli at the expense of non-threatening stimuli in high scoring schizotypes.

1.2.1.2.2.3.4 Emotional dysregulation. Within clinical populations Garety et al. (2001) present evidence that emotional responses to anomalous experiences can influence the way in which such experiences are cognitively processed. In this way, affect regulation has been theorised to play an important role within the development (Garety et al., 2001) and maintenance (Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000) of psychotic phenomenology. High rates of co-morbid anxiety and

depression are also found in non-clinical high-scoring schizotypes (Lewandowski et al., 2006). Where clinical and non-clinical populations are compared in their experience positive schizotypal symptomatology e.g. delusional beliefs, the form and content demonstrate a large degree of overlap; however, the amount of distress and subsequent preoccupation divides the two groups (Peters, Joseph & Garety, 1999).

1.2.1.2.2.3.5 Longitudinal data and prediction of transition to psychosis. Both quasi- and fully-dimensional approaches to schizotypy borrow heavily from the Zubin and Spring (1977) model of psychosis. Zubin and Spring suggest that individuals have unique strengths and vulnerabilities, which contribute towards their risk of developing psychopathology. Within a fully-dimensional approach high schizotypy confers risk towards psychosis through an interaction with environmental stressors. Attempts have been made to identify the specific factors that relate to decompensation process through the use of longitudinal study designs (Klosterkotte, Ebel, Schultze-Lutter, & Steinmeyer 2006; Morrison et al., 2002; van Os, Hanssen, Bijl & Ravelli, 2000). Such study groups have demonstrated that the presence of schizotypal symptomatology is often a precursor to the development of psychosis. Indeed longitudinal studies have demonstrated a 16- to 60-fold increase in risk of decompensation in those endorsing high rates of schizotypal symptomatology (van Os, Linscott, Myin-Germeys, Delespaul & Krabbendam, 2009). Others report the transition rate to be smaller, for example as low as 8% (Hanssen et al., 2005).

In order to improve prediction rates of transition to psychosis other variables such as environmental stressors, have been evaluated for their additional predictive power. In one model proposed by Myin-Germeys, van Os, Schwartz, Stone & Delespaul (2001) evidence is presented that supports a role for specific environmental stressors in improving prediction of transition rates to psychosis. The specific factors

evaluated in their model were: exposure to childhood trauma, living in urban environments, and cannabis use. For example those scoring highly on schizotypy measures carried greater risk of developing psychotic symptoms after cannabis use when compared with individuals with low or average schizotypy scores. It has been suggested that these environmental risk factors result in a behavioural sensitisation towards the development of psychosis in combination with high schizotypy (Myin-Germeys et al., 2001). Behavioural sensitisation implies that exposure to daily stressors is associated with increased intensity of psychotic-like experiences. Similar processes have been noted in psychotic populations (Carlsson & Carlsson, 1990; Garety et al., 2001). For example Garety et al. (2001) postulate psychosocial stress in vulnerable (genetic/ biological predisposition to psychosis) individuals leads to disturbances in basic cognitive processes, emotional dysregulation and heightened threat perceptions. The result of these underlying disturbances in basic processes is the development of psychotic symptoms which meet a clinical level.

Myin-Germeys et al. (2001) demonstrated that exposure to daily stressors had a significant effect on emotional reactivity to daily life and the intensity of low-level psychotic symptomatology. In their own evaluation of the behavioural sensitisation model the authors highlight their concern that much of the evidence in support of their model is based upon cross-sectional studies, thus it is impossible to infer causal relationships for the mechanisms proposed.

The studies discussed in this subsection have proposed schizotypy as a personality trait which denotes a predisposition towards the development of psychosis within non-clinical samples. What follows is a discussion of the differing approaches to measuring schizotypal experiences and their relationship to the prediction of psychosis.

1.2.1.2.3 Psychometric approaches to assessing schizotypy.

1.2.1.2.3.1 Schizotypal personality scales. Measures of schizotypy as a personality trait can be separated into those assessing construct from a quasi-dimensional and fully-dimensional approach. Both attempt to assess schizotypal experiences that lie outside of clinical psychosis, but which may confer risk towards its development.

1.2.1.2.3.2 Quasi-dimensional scales. The psychoticism scale of Eysenck and Eysenck's (1975) personality questionnaire was constructed to measure psychoticism as a personality trait - the presence of psychoticism conferring risk towards psychotic disease progression. Items on the scale tap into antisocial, impulsive, non-conforming, callous and sadistic traits alongside paranoid ideation and anhedonia. The scale has been criticised for its lack of validity in assessing schizotypal traits, in particular its bias towards the assessment of anti-social behaviours (Chapman, Chapman & Kwapil, 1994). Further to this longitudinal studies have demonstrated it lacks predictive power in the prognosis of those who make transition to psychosis (Davis, 1974; Zuckerman, 1989 as cited in Chapman et al., 1994). Eysenck and Eysenck argue that this is due in part to the effects of the disease process itself, which influence clinical participants' scores on such measures. Within their defence of the measure they assert that

‘scores of schizophrenics are lowered by their confusion and their lack of candor (evidenced by their high scores on the MMPI lie scale) as well as by the effects of drug treatment and institutionalization.’ (Chapman et al., 1994, p. 370).

Within this context, and bearing in mind the previously asserted evidence in support of the fully-dimensional approach to schizotypy; scales to assess schizotypy from a quasi-dimensional approach have limited utility within the current research.

1.2.1.2.3.3 Fully-dimensional scales. Fully-dimensional measures are based upon a model where schizotypal symptoms are considered as a milder, and therefore more prevalent, form of schizophrenic symptomatology. At the extreme end of the spectrum such a model would suggest that presence of high schizotypy confers the most risk to developing psychosis. Fully-dimensional scales for the assessment of schizotypy include the Combined Schizotypal Traits Questionnaire (CSTQ; Bentall, Claridge, & Slade, 1989) and the O-LIFE (Mason et al., 1995). The CSTQ is a 420-item self-report questionnaire, which owing to its length, is not practical in many research settings. The O-LIFE on the other hand measures normally distributed self-report schizotypal experiences. It is shorter and less time-consuming to complete granting it increased utility within psychological research. Both have in common the supposition that those at risk of developing psychosis score highly on the measures (Claridge & Beech, 1995 as cited in Raine, 2006). Transition rates based upon O-LIFE scores have been calculated. Such analyses reveal breakdown rates of 40% over a 15-year follow-up (Fenton & McGlashan, 1989) and 25% over 2 years (Schultz & Soloff, 1987 as cited in Fenton & McGlashan, 1989).

One disadvantage of conceptualising schizotypy as a personality trait, both using quasi- and fully-dimensional scales, is they do not offer any indication of an individual's actual risk for transition to psychosis, merely an assessment of the presence of predispositional factors. Further to this their clinical utility is reduced given they are not based upon psychotic diagnostic criteria.

1.2.1.2.3.4 Attenuated symptoms scales. Several measures of schizotypy based upon diagnostic categorisations have been developed. A central tenet of such measures is that attenuated symptoms (schizotypal symptoms) are found to be normally distributed throughout the population, but the associated distress and severity of the

experiences is what defines their clinical significance. Some self-report measures in this domain have been developed to assess single symptoms such as the Peter's Delusion Inventory (PDI; Peters, Joseph & Garety, 1999). The PDI, as with other scales of single attenuated symptoms, measures the presence of such beliefs alongside the degree of conviction with which the belief is held, the amount of distress caused, and frequency of the experience. This gives a detailed assessment of a single symptom, but often the co-occurrence of other attenuated symptoms may result in a clearer clinical picture with regards to calculating risk for transition to psychosis.

Measures assessing the full-range of schizotypal experiences as attenuated symptoms include the Schizotypal Traits Questionnaires (STQ; Claridge and Broks, 1984 as cited in Raine, 1991), the Rust Inventory of Schizotypal Cognitions (RISC; Rust, 1988, as cited in Raine, 1991), and the Schizotypal Personality Questionnaire (SPQ; Raine, 1991). Of these the SPQ has been the most widely utilised and well-validated measure of attenuated psychotic symptoms. Arguably the assessment of attenuated symptoms of psychosis, having their basis in diagnostic categorisations, is a valid way in schizotypal symptomatology can be assessed for clinical relevance. However, the detection of prodromal symptoms which take into account factors relating to the decompensation process alongside presence of schizotypal symptomatology, have proved more reliable in the prediction of psychosis.

1.2.1.2.3.4 Prodromal symptom scales. Prodromal symptoms of psychosis are the symptoms which have been demonstrated to occur immediately prior to the onset of a diagnosable psychotic disorder (Morrison et al., 2002). Although phenomenologically similar to schizotypal symptomatology they are based upon clinically-defined prodromal symptomatology and include careful assessment of the duration, severity and frequency of symptoms, as well as general levels of functioning.

Such measures include the Comprehensive Assessment of At-Risk Mental States (CAARMS; Yung et al., 2003) and the Structured Interview of Prodromal Symptoms (SIPS; McGlashan et al., 2003 as cited in Yung et al., 2003). Both have clinical cut-offs which define individuals at Ultra High Risk (UHR) of developing psychosis. Empirical studies have shown that individuals scoring above clinical cut-offs on the SIPS and CAARMS demonstrate a 40% likelihood of developing psychosis within 12 months and a 50% likelihood of developing psychosis within 24 months (Miller et al., 2003, as cited in Yung et al., 2003). The use of prodromal assessments, however, only demonstrates utility in predicting transition to psychosis within currently help-seeking populations limiting its use within non-clinical samples.

1.2.2 Epidemiology. Schizotypal personality disorder (SPD) is thought to occur in about 3% of the population (Pulay et al., 2009). However, as previously asserted, epidemiological data relating to the presence of schizotypal symptomatology vary depending upon whether a taxonomic or fully-dimensional approach is endorsed. Where schizotypy is narrowly defined within the quasi-dimensional approach, Meehl (1962, as cited in Lenzenweger, 2006) suggests its epidemiology is limited to only 10% of the population. Fully-dimensional approaches; however, take into account the presence of schizotypal symptomatology not conferring risk towards psychosis. In this way, much larger estimates of schizotypal symptomatology are revealed where a fully-dimensional approach to measuring schizotypy is endorsed. In their seminal paper, Johns and van Os (2001) outline some of the epidemiological research in this area. For example in an American study assessing 375 college students, 71% endorsed auditory hallucinatory experiences and 39% endorsed experiences of thought broadcast. Further to this, Johns and van Os (2001) report that in a sample of 586 college students, over 30% had experienced auditory hallucinations in the past month. In a British study, Cox

& Cowling (1989, as cited in Johns & van Os) found 50% of their 60,000 participants endorsed a belief in thought transference, whilst 25% believed in ghosts, and between 4-8% had paranoid beliefs or beliefs about having special powers. These studies demonstrate the wide variations in reported rates of mainly positive schizotypal symptoms within the general population.

1.2.3 Aetiology. Raine (2006) proposes that there are two aetiological pathways to the development of schizotypal personality traits. The first involves genetic and neurodevelopmental pathways resulting predominantly in distortions of the interpersonal and disorganisational subtypes. In contrast to this first route; cognitive-perceptual aberrations feature more heavily in individuals where schizotypal symptoms have developed in response to psychosocial and environmental stressors. Berenbaum, Valera and Kerns (2003) provide evidence that those individuals with schizotypal traits which are more likely cognitive-perceptual in nature are also more likely to endorse psychosocial risk factors such as childhood abuse and exposure to early trauma. Further to this Janssen et al. (2004) demonstrate a dose-dependent effect of exposure to childhood abuse and increases in schizotypal symptoms; specifically perceptual aberrations. Raine (2006) suggests that early trauma and stress result in glucocorticoid and dopamine release which can account for the more cognitive-perceptual disturbances. However, the author also proposes that the social ramification of early psychosocial stress are likely to influence cognitive processes which underlie schizotypal trait development.

Whilst the evidence to support Raine's (2006) model is largely speculative, it does account for the differences in neurochemical, neurological, prenatal environment, as well genetic factors.

1.2.4 Summary. The evidence presented in this section outlined the schizotypy

construct; its structure, and its relevance to the development of psychosis within a continuum approach. Evidence was also outlined in support of two differing definitions of the schizotypy construct; the quasi-dimensional and fully-dimensional approaches. The measurement of schizotypy, and its relationship with transition rates to psychosis, was also evaluated. It was argued that assessment of prodromal symptoms represents the best predictor of transition rates but only in individuals who are currently help-seeking. However, within research utilising non-clinical samples; high schizotypy, within a fully-dimensional approach, also demonstrated utility in predicting psychosis (Fenton & McGlashan, 1989). In identifying presence of schizotypal symptomatology within help-seeking populations it has become possible to offer treatment that is likely to prevent or delay the onset of a psychotic episode (Klosterkotte, et al., 2006; Morrison, et al., 2002; Yung et al., 2005).

Similarities were found between the factor analytical structure of both psychosis and high schizotypes. They were also found to share many cognitive and emotional processing deficits (Freeman, et al., 2011; Garety et al., 2001; Lewandowski, et al., 2006). As such researchers have used schizotypy as an analogue of the psychosis continuum (Steel et al., 2005). Although this remains an area of controversy it has allowed for research which removes the potential confounding factors which are related to the psychotic illness itself; such as the long term impact of multiple hospitalisations and the use of antipsychotic medications. Based upon the evidence presented in this section the current study will utilise a fully-dimensional approach to understanding schizotypy as an analogue of the psychosis continuum.

The following section outlines the self-esteem construct and its relationship with psychopathology. Self-esteem has been considered as an important factor in the development and maintenance of mental ill-health (Fennell, 1999). In fact several

cognitive models of psychosis implicate low self-esteem as an aetiological (Garety et al., 2001) and maintenance (Birchwood et al., 2000) factor. Further to this, given the high rates of comorbid anxiety and depression demonstrated within high schizotypal populations (Lewandowski et al., 2006), and its relevance in the development and maintenance of mental ill-health per se, the self-esteem construct may be of particular interest in this study.

1.3 Self-Esteem

1.3.1 Definition of self-esteem. Global self-esteem was first defined by James (1890) as the extent to which a person appraises themselves as competent; with high self-esteem being inextricably linked to positive mental health (See Orth, Robins & Roberts, 2008 for a review of the literature). In deciding upon a definition of self-esteem the specificity of the construct must be defined; including the different dimensions of self-esteem which have been identified. The next subsection considers the most fundamental of these distinctions - global versus domain specific self-esteem.

1.3.1.1 Global versus domain specific self-esteem. Global self-esteem refers to the overall appraisal of oneself, at any one time, on a scale from high (positive regard) to low (negative regard). Conversely, specific self-esteem relates to an individual's appraisal of themselves in relation to a specific domain such as in the workplace.

1.3.1.2 Temporal lability. Unstable self-esteem refers to the short-term fluctuations in one's contextually based global self-esteem (Kernis, 2005). It "reflects fragile, vulnerable feelings of immediate self-worth that are influenced by the vicissitudes of potentially self-relevant events that either are externally provided (e.g., interpersonal rejection) or self-generated..." (Kernis, 2005, p. 1575). In a longitudinal study, Butler, Hokanson, and Flynn (1994) recorded daily fluctuations in global self-esteem ratings alongside daily stressors. The authors demonstrated that self-esteem

ratings were lower in those who were currently depressed as compared with those who had never experienced a depressive episode. Further to this, the temporal lability of self-esteem predicted increases in depressive symptomatology (Butler et al., 1994) over a 30-day and five-month follow-up period.

One of the general assumptions about self-esteem is that it is an adaptive and motivating factor in human behaviour (Pyszczynski, Greenberg, Solomon, Arndt & Schimel, 2004). For the purpose of this study there is a focus upon the global self-esteem construct; in particular because of its extensive use in clinically relevant literature which will aid comparison with other studies (see Orth, et al., 2008; Zeigler-Hill, 2010). Furthermore, when considering the links between self-esteem and psychopathology it would be difficult to identify the specific facets of self-esteem which would contribute towards the development, or maintenance of, psychopathology in specific individuals. Thus a measure of global, stable, self-esteem in this study is warranted.

1.3.2 Aetiology. Several cognitive models of self-esteem have been proposed (Fennell, 1999; Pyszczynski, et al., 2004). The Fennell (1999) model has been widely utilised clinically and will be described in detail in the next subsection.

1.3.2.1 Fennell's (1999) model of self-esteem. Within the Fennell (1999) model, self-esteem is described as a cognitive representation of the self which is based upon experience, and influences the way in which information is stored and processed. Fennell suggests that a child's early experiences and their perceptions of these experiences form a 'bottom line' - a "fundamental negative conclusion about the self" (Fennell, 1999, p.4). The 'bottom line', akin to core schemas (Beck, 1967), are firmly held beliefs about the self which are formed by an interaction between predispositional factors and experience. Aversive childhood events like bereavement, neglect, abuse, or

absence of sufficient praise and warmth are particularly implicated in the development of negative schemas and low self-esteem (Fennell, 1999). In order to feel more positive about themselves individuals develop strategies which function as guidelines and high standards which must be adhered to in order to feel comfortable. When standards are met individuals are shielded from experiencing the painful truth of the 'bottom line' and the strategy is considered successful. However, when the high standards are not met, self-esteem is further reduced by way of confirmatory evidence of the negative image of themselves. Further to this, negative predictions are made about whether standards will be met, which impact upon mood. Worry and anxiety about whether standards will be met is a common reaction in this situation. Negative predictions and anxiety also drive behaviour through avoidance and behavioural inhibition or disruption. In this way, the pursuit to maintain self-esteem is effortful and often has little effect upon changing the firmly held beliefs associated with the 'bottom line.' Thus the maintenance of self-esteem is a recursive process where schemas are confirmed through experience of actions and behaviour.

Over time biases in perceptual and cognitive processing ensure individuals collect evidence in support the 'bottom line.' Perceptual biases mean that information which fits with the negative view of the self are more easily attended to and processed. Even neutral or irrelevant information can be distorted to fit with the 'bottom line.' Thus the central tenets of the model suggest that low self-esteem is characterised by a global and persistent negative image of the self. There is a lack of appreciation of the different aspects of the self, and both over-estimation of one's own weaknesses and under-estimation of strengths.

Fennell (1999) proposes a model of self-esteem which has its origins within traditional cognitive-behavioural frameworks. Its role as a powerful factor in the

development and maintenance of psychopathology has been implicated in many models of psychopathology. The relationships between self-esteem and psychopathology are considered in the next subsection.

1.3.2.2 Self-esteem and psychopathology. Self-esteem has been inextricably linked with psychopathology. Sowislo & Orth (2013) conducted a meta-analysis of longitudinal studies investigating the nature of the relationship between global self-esteem, depression, and anxiety. The evaluation comprised 77 studies on depression and 18 studies on anxiety including differences in sample and methodological characteristics. The weighted mean effect size of self-esteem on depression ($\beta = -.16, p < .05$) was significantly stronger than the effect of depression on self-esteem ($\beta = -.08, p < .05$).

The pursuit of high self-esteem has been linked with adverse outcomes too. For example in increased risk of making biased assumptions (Crocker & Park, 2004) or being hostile towards those who threaten an individual's self-esteem (Twenge & Campbell, 2003). Since self-esteem is contingent upon self-evaluation there is also a risk of self-absorption and a lack of concern for others according to Neff (2003).

1.3.2.2.1 Self-esteem and schizotypy. There is a paucity of literature investigating the mechanisms through which self-esteem and schizotypy may be related. This is despite robust evidence demonstrating an association within clinical psychotic populations, which is evaluated in a later section. Where a continuum approach to psychosis is endorsed, there would be an expectation that similar findings to those found in clinical populations would also be present within schizotypal presentations. Further evidence which is suggestive of a relationship between schizotypy and self-esteem comes from the overlap between schizotypy and other co-morbid psychopathologies (Lewandowski, et al., 2006). Since self-esteem has been

posited to underpin the development and maintenance of many psychopathologies (Fennell, 1999; Sowislo & Orth, 2013) the absence of data relating schizotypy and self-esteem would seem an overlooked area of research.

What little evidence does exist can be found in large scale prospective studies such as van Os, Hanssen, Bijl, and Ravelli (2000). The authors found that those who went on to be diagnosed with a psychotic illness, within the three-year follow up period of the study, were more likely to have negative self-schemas and low self-esteem at baseline assessment. This indicated that prior to the onset of psychosis there was a relationship between low self-esteem and schizotypal symptomatology. Building upon this research, Thewissen, Bentall, Lecomte, van Os and Myin-Germeyns (2008) used an experience sampling method to look in detail at the relationship between temporal fluctuations in self-esteem and their relationship with the non-clinical paranoid ideation. They found that decreases in self-esteem were significantly associated with increases in paranoia. Further to this, increased paranoia was also associated with more temporal fluctuations in self-esteem. The authors propose a mechanism by which the two are related; in which paranoia is considered to be a dysfunctional strategy in the pursuit of maintaining high self-esteem. Another article in this domain found that a targeted social skills intervention improved self-esteem in high scoring schizotypes (Lieberman & Robertson (2005). The authors used a sample of 33 secondary school students who scored highly on a self-report measure of trait schizotypy. The aim of the study was to investigate whether targeting high schizotypes, and improving their social competency, could prevent development of psychopathology. Participants were randomly assigned to either a control or intervention group (social skills training). The intervention consisted of weekly, group therapy sessions for eight weeks, targeting the development of social skills. Baseline scores on the SPQ (Raine, 1991), Rosenberg Self-Esteem

Scale (RSES; Rosenberg, 1965) and the Teenage Inventory of Social Skills (TISS; Inderbitzen & Foster, 1992 as cited in Lieberman & Robertson, 2005) were collected. Although controversial; given the authors used a trait measure of schizotypy, they utilised the SPQ as one of the primary outcome measures at post-intervention and follow-up. The authors note that this decision was taken to reflect the fact that at this age (14-17 year olds) “personality is considered to be still developing, rendering the dimensional ‘traits’ more malleable.” (Lieberman & Robertson, 2005, p. 179). Repeated measures ANOVA revealed the intervention had a significant effect upon reducing students’ scores on the RSES and the SPQ both post-intervention and 12-month follow-up. The authors conclude that this pilot study provided tentative evidence of the role which improvements in social functioning and self-esteem may have in conferring protection against psychopathology in a high school student population. However, the generalisability of the results may be limited given the small population (N = 33) and its relatively short follow-up period.

Although there is a paucity of literature investigating the relationship between self-esteem and schizotypy, a clearer association has been demonstrated in clinical populations. The following subsection outlines the research linking self-esteem to psychosis populations.

1.3.2.2.2 Self-esteem and psychosis. There is a large body of evidence linking low self-esteem with mental health problems; both as an antecedent in their development (Beck, 1967; Silverstone, 1991; Silverstone, & Salsali, 2003) and as a consequence of stigmatisation (Iqbal, Birchwood, Chadwick, & Trower, 2000). Within psychosis populations incidence rates of low self-esteem and self-criticism are common, pervasive, and occur throughout various points of the prodromal and acute phases (Bradshaw & Brekke, 1999; Freeman et al., 1998; Lecomte et al., 1999).

1.3.2.2.3 Self-esteem as a factor in the maintenance of psychosis. The importance of self-esteem in the maintenance of psychosis was demonstrated in a study utilising participants who were recovering from psychosis. Smith et al. (2006) recruited 100 participants and measured baseline self-esteem ratings, residual psychotic symptomatology, distress and depression. The results of the study indicated that there was a highly significant negative correlation between self-esteem and some psychotic symptomatology, specifically delusional beliefs ($r = -.36, p < .001$). Individuals with lower self-esteem also expressed more distress associated with their symptoms.

1.3.2.2.4 Self-esteem as a factor relating to the consequence of psychosis. It has been argued that the association between psychosis and self-esteem is a result of the disease process itself (Bentall & Kaney, 1996; Birchwood et al., 2000). Within such models, the consequences of experiencing a psychotic episode; such as loss of social role, stigma, multiple hospitalisations, and medication effects, results in low self-esteem. The outcome is also observed in enduring negative schemas and a propensity towards depression in the post-psychotic or recovery phase. Where individuals are unable to integrate their experience of psychosis into a reconstructed sense of self, they will "...fall short of their preferred or aspired-to self, resulting in a sense of entrapment and loss." (Birchwood et al., 2000, p. 522).

The robust association between low self-esteem and psychosis has led to the development of self-esteem therapies for psychosis. For example in a pilot study by Hall and Tarrrier (2003) twenty-five male participants with a primary diagnosis of psychosis were recruited whilst inpatients on an acute mental health unit. The study was a randomised control trial in which participants were allocated to receive either; seven sessions of CBT specifically targeting low self-esteem, or to a waiting-list control condition. There was a highly significant effect of the intervention upon measures of

self-esteem, which was maintained at three-month follow up. The authors also report significant effects of the intervention upon psychotic symptomatology and social functioning at post-treatment and three-month follow-up.

These initially promising results were further reinforced by a waiting list-controlled study by Knight, Wykes and Hayward (2006). This study employed a group intervention targeting low self-esteem and stigma in 21 patients with a primary diagnosis of psychosis. Following the intervention participants experienced a significant increase in self-esteem ratings and highly significant reductions in their ratings of both positive and negative symptoms of psychosis ($p < 0.001$) and depression ($p = .008$). Both studies (Hall & Tarrier, 2003; Knight et al., 2006) demonstrate that targeting low self-esteem in psychosis can be efficacious in reducing psychotic symptomatology and maintaining this effect post-intervention. However, the study designs do not allow for any conclusions to be made about whether low self-esteem is related to the development of psychosis, or results from the experience of psychosis itself. Investigating these relationships, in an analogue sample using the schizotypy construct as a representation of the continuum of psychosis, may shed light on whether this association is found prior to the onset of psychosis.

1.3.3 Summary. The self-esteem construct has been outlined in this section along with its links to mental ill-health, and in particular schizotypy and psychosis. Evidence was presented which provides a theoretical framework for understanding the relationship between self-esteem and psychotic phenomena (Garety et al., 2001; Birchwood et al., 2000). Garety et al. (2001) suggest low self-esteem as a risk factor in the development of positive psychotic phenomena, whereas Birchwood et al. (2000) hypothesise low self-esteem is the outcome of experience of a psychotic episode itself. Experimental data from small-scale randomised controlled trials (Hall & Tarrier, 2003;

Knight et al., 2006) appears to validate the association between low self-esteem and psychotic symptomatology. The efficacy of such interventions, demonstrates that interventions targeting low self-esteem in psychotic populations are a worthwhile pursuit. Within a continuum approach to psychosis it would be expected that similar findings would be present in non-clinical samples endorsing schizotypal experiences. In support of this view evidence was presented which demonstrated a significant association between schizotypal symptomatology and low self-esteem in an epidemiological study (van Os et al., 2000). Further to this a social skills intervention was found to improve ratings of self-esteem in a high-scoring schizotypal group (Lieberman & Robertson, 2005).

Self-esteem is linked to positive affect; however, it is an evaluative process. Some authors note that in the pursuit to maintain high self-esteem there can be negative outcomes such as self-absorption and lack of concern for others (Neff, 2003). Self-compassion, although also linked to positive affect, is not an evaluative process and promotes affiliation with others. It therefore enables positive affect without the negative outcomes associated with striving to maintain high self-esteem (Gilbert, 2009; Neff & Vonk, 2009). Given the overlap between the self-esteem and self-compassion constructs (Neff, 2003), and emerging evidence that self-compassionate therapies are effective in reducing distressing psychotic symptomatology (Braehler, Gumley, Harper, Wallace, Norrie & Gilbert, 2012; Laithwaite et al., 2009; Mayhew & Gilbert, 2008), the following section reviews the literature regarding the self-compassion construct and its relationship with schizotypal and psychotic symptomatology.

1.4 Self-Compassion

1.4.1 Definitions of self-compassion. Self-compassion can be conceptualised in many ways. One definition is that it is a non-judgemental acceptance of oneself

including weaknesses (Neff & Vonk, 2009). Those who are unable to take a non-judgmental stance towards their imperfection can be left feeling isolated; since imperfection and failure are a part of life. Neff (2003) suggests that self-compassion encompasses three constructs relating to kindness, common humanity and mindfulness. Kindness involves being kind and warm in the face of difficulties as opposed self-critical and judgemental. Common humanity is the ability to see your own experience as part of the human condition rather than viewing through a personal lens of isolation and shame. Finally, taking a mindful approach towards experience involves holding painful thoughts in awareness rather than pushing them away or denying them.

Developing compassion for oneself and others as a way of improving mental well-being has been the focus of research by Gilbert (2005, 2009). The notion of feeling cared for and accepted by others is deemed essential for physiological maturation and psychological well-being (Cozolino, 2007; Siegel, 2001, 2007 as cited in Gilbert, 2008). This is integral to Gilbert's concept of self-compassion, which encompasses evolutionary, social and neuropsychological perspectives. Gilbert (2010) suggests that within Compassion Focussed Therapy (CFT), self-compassion is defined as the development of motivation and attention to address pain and suffering in others and the self. However, in attending to the suffering one must take a tolerant and empathic view of the causes and sources of pain. In this way, individuals learn to take a non-condemning, open, and mindful orientation to human experiences.

1.4.2 Aetiology. Gilbert (2005) has proposed a model for understanding the aetiology of self-compassion. This draws upon attachment theory, evolutionary biology and neurobiology. Gilbert suggests that ancient systems within the brain recognise and respond to an infant's distress in order to maximise the chances of survival of their offspring. It is proposed these nurturing behaviours have their origins in attentional

systems from which the development of self-compassion can emerge. The evidence for this evolutionary approach to self-compassion will now be outlined.

In a study by Gilbert (2008), positive affect; specifically feeling cared for and caring for others, was found to be more highly correlated with lower depression, anxiety and stress than were other positive feelings such as excitement and achievement. This forms one of the basic premises underpinning self-compassion; that compassionate positive emotions are essentially different to other positive emotions. There is neurophysiological evidence to substantiate this. For example compassionate positive emotions are associated with increased release of endorphins and oxytocin (Panksepp, 1998; Depue & Morrone-Strupinsky, 2005, as cited in Gilbert, 2008), whereas positive affect relating to achievement is mediated by dopaminergic systems (Panksepp, 1998, as cited in Gilbert, 2008).

Based upon these differences in positive affect Gilbert (2005) proposed an interacting three systems model (see Figure 2) to account for the development of self-



Figure 2: Interaction between three major affect regulation systems (Gilbert, 2009).

soothing system is also associated with positive affect it elicits calming and soothing positive regard in which individuals do not face threat, nor are they striving to achieve. The threat system is focussed upon reactions to stressors. The systems exert feedback upon one another and akin to muscle development each becomes stronger when

regularly activated. One example of this is an infant who has regular experiences of being cared for and soothed, such individuals will be better able to recall soothing in the face of threat (Schore, 1994 as cited in Gilbert, 2008). This allows for greater resilience to the effect of stressors.

1.4.2.1 Social mentality theory. Gilbert describes the development of the three systems within social mentality theory (2005). Social mentalities are the emotional, motivational, cognitive and behavioural processes that guide interactions and evaluations of the self and others. They enable both the processing of threats and feelings of safeness. In this way affect is regulated according to how threatening or safe individuals perceive the environment.

The origins of social mentalities are posited to occur in early child development. Infants display affiliative behaviours that result in attachment bonds being formed with caregivers. It is likely that this form of social attachment maintains physical proximity and elicits care from a primary caregiver. In evolutionary terms such a process increases the probability of infants being able to reach maturity and reproduce (Bowlby, 1980, as cited in Gilbert, 2005). Carter (1998) suggests that securely attached infants receive regular experiences of a parent calming and comforting them. It is through these experiences that the infant develops their soothing system in order to regulate responses to threat. Conversely, infants who do not receive regular stimulation and development of the soothing system are less able to utilise it in order to manage negative affect. It is therefore likely that infants who are exposed to aversive early experiences without a secure attachment will also have an under-developed soothing system. Gilbert (2005) also suggests that an over-developed threat system is likely to be activated in response to situations involving social rank, where individuals are more likely to focus on the perceived power that others may have over them.

1.4.2.2 Neurobiological theory. One possible explanation for the neurobiological basis for self-compassion comes from an understanding of the threat processing systems within the brain. When endorphins and hormones (e.g. oxytocin) are released whilst under threat, it promotes physical closeness and has a soothing effect upon individuals (Bell, 2001; Wang, 2005, as cited in Gilbert, 2009). In animal models oxytocin appears to attenuate separation anxiety in infants (Shapiro & Insel, 1990, as cited in Gilbert, 2005). Oxytocin has also been shown to modulate affiliative behaviours in infants (Shapiro & Insel, 1990, as cited in Gilbert, 2005). As such the development of a soothing system may be related to oxytocin release during early attachment formation.

1.4.3 Self-compassion and psychopathology.

1.4.3.1 Anxiety and depression. Neff (2003) has been particularly concerned with the nature of the relationship between self-compassion and psychopathology. In one study Neff recruited 391 undergraduate students to investigate the nature of the relationship between self-report self-compassion, self-esteem, depression, and anxiety scores. The results indicated that self-compassion had a significant negative correlation with depression, ($r = 0.55, p < .01$) and with anxiety, ($r = 0.66 p < .01$). It was noteworthy that the highly significant correlation remained after self-esteem was controlled for. MacBeth and Gumley (2012) sought to synthesise the literature regarding the nature of the relationship between self-compassion and psychopathology in a meta-analytical review. Specifically the authors sought to determine the strength of the association between self-compassion, depression, anxiety and stress. An aggregated effect size for self-compassion and psychopathology was calculated $r = -0.54, p < .0001$, with increased self-compassion being associated with reduced psychopathology.

One mechanism through which self-compassion may confer protection from psychopathology development was investigated by Leary, Tate, Adams, Allen and Hancock (2007). In a series of studies the authors sought to investigate the cognitive and emotional processes through which self-compassionate individuals responded to stressful situations. Within the study design participants reported on actual events e.g. daily stressors, and a range of real and imagined situations examined under experimental conditions. The authors demonstrated that self-compassion acted as a moderator in the relationship between exposure to negative events and emotional responses to such events. That is level of self-compassion altered the strength of the relationship between stressful situations and negative emotional responses.

The ability of self-compassion to act as a buffer against the impact of negative life events is of particular relevance in this study given the clear support for the association between schizotypy and general psychopathology (Lewandowski et al., 2006). It could be that self-compassion reflects an underlying mechanism in the development of mental ill-health. To date there are no studies investigating the nature of the relationships between schizotypy and self-compassion, however, what follows is a review of the literature pertaining to the relationships between self-compassion and psychotic symptomatology in clinical populations. This literature is reviewed because, in the context of schizotypy representing the continuum of psychosis, it would be hypothesised that similar underlying mechanisms should also underpin schizotypal symptomatology.

1.4.3.2 Psychosis. Few studies, outside of treatment trials, have investigated the relationship between self-compassion and psychotic symptomatology (Hutton, Kelly, Lowens, Taylor & Tai, 2013). Those which have concentrate upon the associations between specific facets of self-compassion (self-attacking and self-reassurance) and

paranoid beliefs (Boyd & Gumley, 2007; Hutton et al., 2013; Mills, Gilbert, Bellew, McEwan, & Gale, 2007). The evidence supports a link between low self-compassion and increased paranoid ideation in clinical populations. One way in which the association between self-compassion and psychosis has been understood is through the similarities in aetiological factors. High rates of psychosocial stressors have been demonstrated in populations diagnosed with psychosis (for a review see Read, van Os, Morrison & Ross, 2005) as in low self-compassionate individuals (Gilbert, 2005). Further to this, high rates of negative affect and heightened threat appraisals are also observed in psychosis populations (Freeman & Garety, 2003). Similarly low self-compassionate individuals are posited to have over-developed threat systems and problems associated with emotional dysregulation (Gilbert, 2009). Similarities can also be drawn from the interpersonal sequelae of both low self-compassion and psychosis; including increased monitoring of social threats, isolation and social withdrawal (Birchwood et al., 2000; Garety et al., 2001; Gilbert, 2009; Morrison, 2001). Given the similarities in aetiological factors, plus social, cognitive and emotional overlaps between the constructs; self-compassion has become an area of interest in the treatment of psychosis.

1.4.3.3 Self-compassionate therapy for psychosis. Therapies for the treatment of psychopathology which are based upon a compassionate and mindful approach have become known as ‘third wave’ psychological therapies. They include Dialectical Behavioural Therapy (DBT; Lineham & Dimheff, 2001), Compassion-Focussed Therapy (CFT, Gilbert, 2010) and Acceptance and Commitment Therapy (ACT; Hayes, Strosahl, & Wilson, 2003). Some promising small-scale research trials have demonstrated the effectiveness of self-compassionate therapies for psychosis. These will now be reviewed.

1.4.4 Structure of the literature review. A literature review was conducted to examine the efficacy of compassion-focussed therapies for individuals with psychosis. Initially a number of electronic databases were accessed through the University of East Anglia's online catalogue (Metalib, comprising of: Intute Social Sciences, PsychINFO, Web of Science/Web of Knowledge and NCBI Pubmed). The terms self-compassion, compassionate mind and psychosis were entered. The related terms mindfulness, schizotypy, delusions, paranoia, were also used to identify all relevant articles. The second stage of the literature search involved hand searching the reference lists of the papers already identified.

1.4.4.1 Inclusion and exclusion criteria. Articles where the focus was on issues which were irrelevant to the current study; such as compassion towards others or compassion fatigue, were not included. Mindfulness therapies with an ACT and DBT focus were also excluded. The search was also restricted to empirical articles in peer reviewed journals written in the English language. In order to maximise the available research there were no restrictions placed on dates, sampling, or the methodological approaches employed. In total 122 articles were identified, 16 of which met the inclusion criteria. Table 1 presents the results of these studies.

1.4.4.2 Mindfulness-based approaches. The earliest studies identified in the literature search were based upon within-subjects and qualitative designs (Abba, Chadwick & Stevenson, 2008; Chadwick, Taylor & Abba, 2005; Davis, Strasburger, & Brown, 2007). Chadwick, et al. (2005) conducted a small-scale study utilising 11 participants with a diagnosis of a schizophreniform disorder. It was a within-subjects design with no control. Participants took part in mindfulness training groups and outcomes were measured using behavioural and symptomatology ratings, mindfulness

Table 1

Results of Systematic Literature Search

Author(s)	N =	Treatment modality and study design	Outcome
1. Chadwick et al., 2005	11	Mindfulness training. Within subjects design	Reduction in distressing symptoms ($z = 12.655, p = .008$) and increased ability of participants to react mindfully to distressing symptoms by an average of 36.6%
2. Davis, et al., 2007	5	Mindfulness training, qualitative study	Core themes identified as increased awareness of symptoms, and decreased distress and negative self-judgments
3. Abba et al., 2008	16	Mindfulness training, qualitative study	Identified core theme of change as beginning to relate differently to positive psychotic symptoms
4. Mayhew & Gilbert, 2008	3	Compassionate Mind training. Single case studies	Improvements in psychopathology and psychotic symptomatology ratings post-treatment, which were not maintained at 6-month follow-up
5. Chadwick et al., 2009	22	Mindfulness training vs waiting-list randomised controlled study	No significant differences in symptomatology between groups. However after second group, within subjects comparisons of pre and post revealed significant improvement in clinical functioning ($p = .013$)
6. Newman et al., 2009	2	Single case study of mindfulness training	Belief conviction, distress associated with voices decreased and mindfulness increased
7. Laithwaite et al., 2009	19	Compassionate-mind training in group format, within-subjects design	Post-treatment reductions in psychotic symptomatology ($r = 0.38, p < .05$), which were maintained at 6-week follow-up
8. Dannahy et al., 2011	62	Mindfulness cognitive therapy, within subjects design	Significant increases in well-being and perceived control over voices. Significant decreases in distress associated with voice-hearing
9. Jacobson et al., 2011	8	Mindfulness training, within subjects design	Inconclusive data. Both increases and decreases in stress and amount of interference due to psychotic symptoms between pre and post-group measures
10. Johnson et al., 2011	18	Loving kindness meditation. Within subjects design	Reductions in psychotic symptomatology, particularly introverted anhedonia, at post-treatment
11. Ashcroft et al., 2012	95	Mindfulness training, qualitative study	Core mechanisms of change were associated with relating to people differently, increased understanding and acceptance of symptoms.
12. Braehler et al., 2012	40	Compassion-focussed therapy, RCT	65% of Tx group reported symptom improvement, compared to 5% of TAU group
13. Langer et al., 2012	23	Mindfulness training plus CT vs waiting-list, randomised controlled trial	Significant differences in ability to respond mindfully to distressing symptoms, but no significant differences between the groups on change in symptomatology
14. Davis & Kurzban, 2012		Literature review of mindfulness based therapies for treatment of severe mental illness	
15. Ellett, 2013	2	Mindfulness training, single case study	Ratings of conviction, distress, impact and preoccupation with paranoid beliefs reduced from baseline. Increases in mindfulness from baseline and maintained at 1 month follow-up
16. van der Valk et al., 2013	13	Mindfulness training, within subjects design	No adverse effects of treatment on psychotic symptomatology

and therapeutic factor scales. The results indicated that the mindfulness training was effective in reducing distressing symptomatology ($z = 12.655, p = .008$) and increased the ability of participants to react mindfully to distressing symptoms by an average of 36.6%. The theoretical basis of this approach was then investigated using grounded theory (Abba et al., 2008; Davis et al., 2007). Abba et al. (2008) posited the change process, within the mindfulness group, to be due to individuals beginning to relate differently to their positive psychotic symptoms. In this way the participants were not seeking to remove the psychotic experiences, but develop a new way of relating to them in order to reduce the associated distress. The core variable identified in the study was the development of a new way of relating to positive symptoms. This included redefining their relationship with psychotic features, such that they felt more in control of symptoms, and less likely to react emotionally to them. Davis et al. (2007) found participants in their qualitative study could relate increasing mindfulness with an increased awareness of symptoms, and decreased distress and negative self-judgments. One other qualitative study has explored the use of mindfulness training in a first episode of psychosis population (Ashcroft, Barrow, Lee & MacKinnon, 2012). The research explored how mindfulness training related to participants' experience of psychosis. Four main themes emerged from the research: being able to use mindfulness, making sense of mindfulness, relating to people differently, and increased self-understanding and acceptance.

There have been six other, within groups, or single-case studies investigating the impact of mindfulness training on treating psychotic symptomatology. Several authors have reported positive outcomes relating to decreases in distress, preoccupation with voices, and increased control over voices (Dannahy et al., 2011; Ellett, 2013; Newman, Harpe & Chadwick, 2009; van der Valk van de Waerdt, Meijer, van den Hout, de Haan,

2013). One study identified non-significant differences in measures of psychotic symptomatology and distress following mindfulness-based training (Jacobson, Morris, Johns, & Hodkinson, 2011). These earliest studies had small sample sizes and no controls. The methodological limitations of the single case and within subjects' studies were overcome by Chadwick, Hughes, Russell, Russell and Dagnan (2009). This randomised controlled trial investigated the efficacy of mindfulness-based training versus waiting-list control in the treatment of distressing voices and paranoia. No significant differences in symptomatology were found between the two groups. Further to this another randomised controlled trial of mindfulness-based cognitive therapy versus waiting-list control efficacy study was carried out by Langer, Cangas, Salcedo, and Fuentes (2012). The study recruited 23 participants diagnosed with psychosis. Significant between groups effects were found on measures of ability to react mindfully to stressful internal experiences ($t = 2.44, p = .028$). However, no significant differences were found between the groups on measures of psychotic symptomatology.

1.4.3.3 Compassion-focussed therapy. Further to the use of mindfulness-based interventions, Compassion-Focussed Therapy (CFT; Gilbert, 2010) and Compassionate Minds Training (CMT; Gilbert, 2010) approaches have also been utilised in the treatment of psychosis (see Table 1 for summary). The earliest study of this type was conducted by Mayhew and Gilbert (2008). The authors recruited three participants diagnosed with psychosis and who experienced auditory hallucinations. Participants were administered twelve individual sessions of CMT. Outcomes were assessed using measures of intensity, frequency, distress and beliefs about psychotic phenomena, psychopathology (anxiety, depression, and obsessive-compulsive behaviours) and self-compassion. All three participants demonstrated reductions in their overall psychopathology scores and measures of their psychotic symptomatology at post-

treatment. However, at six-month follow-up the participants experienced some increases in general psychopathology and psychotic symptomatology. Two of the three participants rated themselves as being high in self-compassion at pre-treatment. These ratings were maintained at post-treatment and six-month follow-up. The third participant demonstrated increases in ratings of self-compassion from pre- to post-treatment, which was maintained at six-month follow-up. The authors concluded that CMT was a safe, non-judgemental approach to treating malevolent voices in this cohort. Instead of focussing upon distorted or unhelpful cognitions, as in a CBT approach, CMT focussed upon developing self-soothing techniques to reduce distress and threat associated with hallucinatory experiences. The effect of CMT in this study appeared to be in stimulating self-soothing in response to voice-hearing, which made them less persecutory and less malevolent. Qualitative reports suggested that this also impacted upon participants' ability to engage socially post-treatment.

A pilot study carried out by Laithwaite et al. (2009) investigated the use of CMT for improving self-esteem, targeting positive and negative symptoms of psychosis, and reducing depression. The study utilised participants residing in a high security setting with diagnoses of psychosis. It was a within-subjects design, in which 19 participants took part in a group-based intervention over 10-weeks (20 sessions) with no control group. Participants were administered self-report questionnaires of self-esteem, social-comparison, and depression. Clinician ratings of psychotic symptoms were made using the Positive and Negative Syndrome Scale (PANSS; Kay, Fiszbein & Opler, 1987). The measures were administered at baseline, post-intervention and six-week follow-up. At the end of treatment significant changes on the depression outcome scale were found ($r = 0.38, p < .05$), which were maintained at 6-week follow up ($r = 0.47, p < 0.1$). Post-treatment significant changes were also demonstrated on the measure of psychotic

symptomatology ($r = 0.38, p < .05$), which were maintained at 6-week follow up ($r = 0.41, p < .01$). An overall significant change in self-esteem ratings was found from baseline to 6-week follow up ($r = 0.47, p < .01$) but only on one of the measures of self-esteem (Rosenberg Self-Esteem Questionnaire; Rosenberg, 1965). Significant changes were not found on measures of self-compassion. The authors conclude that this may be the result of offenders having difficulty in accepting self-forgiveness and compassion for themselves because it may be misinterpreted as lack of remorse or empathy for their victims.

Another study utilising a compassion-based approach in the treatment of psychosis, was carried out by Johnson et al. (2011). The pilot study investigated the effect of Loving-Kindness Meditation (LKM) upon residual negative symptoms of schizophrenia. LKM is a technique used to increase feelings of warmth and caring for self and others to “change the orientation to life experiences and result in a broadening of the range of emotional responses and choices available.” (Johnson et al., 2011, p. 138). The study recruited 18 outpatients all with a diagnosis of a schizophrenia-spectrum disorder and experiencing residual negative symptoms. Symptom ratings were assessed at pre, post, and three-month follow-up using measures of negative psychotic symptoms, meditation practice, psychological recovery and activity diaries. Participants reported decreases in negative symptoms particularly anhedonia. There were no changes in activity levels, but self-report measures of psychological recovery indicated that participants felt a greater sense of social inclusion from having been part of a group treatment. Further to this, there were increases in satisfaction with life, sense of control, and self-acceptance. The results of the study indicate that in this group of participants LKM or some other aspect of the treatment modality (such as the group setting itself) was effective in reducing the negative symptoms of psychosis and had an

impact upon psychological recovery from psychosis. However, the design of the research was within-subjects, with no control group. As such, no conclusions about the efficacy of LKM can be made because the results may be in part due to other variables such as social interaction through the group setting. The measures used in the study were not well validated in this population and the assessor for the clinician-rated measures was not blind to the intervention; thus the likelihood of biases in symptom reporting could be high.

A final study examining the change process in CFT for psychosis was carried out by Braehler et al. (2012). This study built on previous pilot studies and was a randomised controlled clinical trial. Participants were 40 outpatients with a diagnosis of a schizophrenia-spectrum diagnosis. Measures included recovery style, symptom improvement scales, beliefs about illness, fear of relapse, depression and psychotic symptomatology scales. The results indicated that those in the CFT treatment group were more likely to report symptom improvements (65%) compared to the Treatment As Usual (TAU) group (5%). Within the CFT group, participants demonstrated a reduction in avoidance behaviours ($r = 0.41$) and increases in compassion, which reached statistical significance ($r = 0.59$, $Z = 2.36$, $p = 0.02$). Within the TAU group, non-significant effects of TAU were found between baseline and post-treatment measures. Increases in self-compassion were significantly associated with; decreases in depression within the CFT group ($r = 0.77$; $p = 0.001$), shame ($r = 0.57$; $p = 0.027$), social marginalization ($r = 0.74$; $p = 0.002$), and fear of relapse ($r = 0.52$; $p = 0.045$). There was a low attrition rate from the study (18%) and the authors concluded that the absence of serious adverse effects of CFT made this a safe and acceptable form of treatment in this group. This study adds to the evidence for self-compassionate therapy

for psychosis; however, some of the limitations of the study include regulation of TAU and fidelity to the treatment plan which was not formally assessed.

The evidence for self-compassionate treatments for psychosis is in its infancy; although early indications are that it is a safe treatment which is associated with reductions in both negative and positive psychotic symptomatology. The research so far has concentrated upon using self-compassionate based therapies in recovery from psychosis; particularly in the treatment of residual negative symptomatology (Braehler, et al., 2012; Laithwaite et al., 2009; Mayhew & Gilbert, 2008), and the distress associated with positive symptomatology through the use of mindful approaches (Chadwick et al., 2005; Dannahy et al., 2011; Newman et al., 2009). Mindfulness-based approaches have targeted psychotic symptomatology particularly in relation to voices and paranoid delusional beliefs; however, the results of both single-case studies and controlled trials have been equivocal.

1.5 Conclusions and Development of Research Questions and Hypotheses

Within this chapter evidence has been presented in support of two differing approaches to understanding schizotypy: the quasi-dimensional (Meehl, 1962) and the fully-dimensional (Claridge, 1997). Much of the evidence outlined provided support for the continuum of psychosis, indeed also for the use of schizotypy as a valid measure of this continuum. An evaluation of the literature showed that three main factors provide support for schizotypy as a valid analogue of the psychosis continuum in non-clinical samples. The first factor is that research has reliably demonstrated the same three-factor solution for both psychotic symptomatology (in clinical populations) and trait schizotypy (Bentall, et al., 1989; Tarboxa & Pogue-Geilea, 2011). The second factor relates to the genetic inheritability of psychotic-like symptomatology, which has been shown to be elevated in psychosis probands compared with controls (Cella, et al.,

2013; Kendler, et al., 1985; Kendler, et al., 1996). This is suggestive of a shared genotype for both psychosis and schizotypy. The third factor relates to the presence of similar cognitive deficits, as well as emotional and social dysfunction, which are observed in both patients diagnosed with schizophrenia and non-clinical populations experiencing schizotypal symptomatology (Freeman, et al., 2011; Langdon & Colthart, 1999; Lewandowski et al., 2006; Pickup, 2006; Steel et al., 2002). Thus similar cognitive, emotional and interpersonal deficits may underlie both schizotypal and schizophrenic presentations. Research into the mechanisms underpinning psychosis have benefitted from using schizotypy as an analogue of psychosis (Freeman et al., 2011; Steel et al., 2005; Steel et al., 2008). Not only has the use of schizotypy allowed for the specificity of cognitive models to be enhanced; negating the use of clinical populations, but it also reduces the impact of the disease process through utilisation of non-clinical populations.

Longitudinal data was also evaluated in which measurement of trait schizotypal, attenuated, and prodromal symptoms of psychosis, were used as a predispositional factor in estimating risk of transition to psychosis (Klosterkotte, et al., 2006; Morrison et al., 2002; van Os et al., 2009; Yung et al., 2005). Trait schizotypy measures such as the O-LIFE and more diagnostically-relevant scales such as the SPQ were evaluated for this use. Although the SPQ would arguably provide more clinically-relevant information about individuals' specific risk of decompensation; the O-LIFE has the advantage of assessing normally distributed schizotypal symptomatology. Further to this it has also demonstrated some utility in predicting breakdown rates to psychosis (Fenton & McGlashan, 1989; Schultz & Soloff, 1987).

Within clinical populations relationships have been demonstrated between self-compassion and psychosis (Braehler et al., 2012; Laithwaite et al., 2009; Mayhew &

Gilbert, 2008). Where a continuum approach to psychosis is endorsed it would be expected that similar findings should be found between schizotypy and self-compassion. Further to this, theoretical associations between the aetiology of schizotypy and low self-compassion (Gilbert, 2009; Raine, 2006) were also made based upon a synthesis of the literature. Within this context, the first hypothesis made in this study is that there will be a negative correlation between self-compassion and schizotypy scores.

The relationship between schizotypy and low self-esteem was highlighted by the van Os et al. (2000), and Lieberman and Robertson (2005) study. Further to this a robust relationship between self-esteem and psychosis has been demonstrated. Again, where a continuum approach to psychosis is endorsed, it would be expected that a similar relationship between low self-esteem and schizotypy would be found. This forms the basis of the second hypothesis in the current study, which is there will be a negative correlation between schizotypy and self-esteem scores.

Schizotypy has been demonstrated to have a robust association with other psychopathology (Lewandowski, et al., 2006). However, the chronology and mechanisms underlying the co-morbidity between schizotypy and mental ill-health have so far been relatively under-researched. Self-esteem and self-compassion were chosen as potential targets for understanding such mechanisms given the robust relationship between the constructs in clinical psychotic populations, but also their relationship with psychopathology in general. In utilising a non-clinical sample the current study aims to determine whether there is any evidence of self-compassion and self-esteem providing a framework for understanding the mechanisms underpinning schizotypy. This has the advantage of reducing the likelihood of any findings being a consequence of the disease process itself.

Evidence was presented which supported the notion of self-compassion as a stable trait with its roots within early attachment behaviours, whereas self-esteem was demonstrated to be more temporally labile (Neff & Vonk, 2009). Research also demonstrated that when self-esteem is controlled for, self-compassion remained a significant predictor of psychopathology (Neff, 2003), and moderated reactions to actual and imagined distressing situations (Leary et al., 2007). In this way level of self-compassion altered the relationship between real, remembered, and imagined events and subsequent negative emotions. This has led some to conclude that self-compassion, over self-esteem, may act as a buffer against feelings of anxiety in stressful situations (Neff, 2003; Leary et al., 2007). Within his social mentality model, Gilbert (2009) suggests that low self-compassionate individuals are more likely to rely upon a striving/achievement system (akin to self-esteem) for positive affect. Thus in the context of highly significant correlations between self-esteem, self-compassion, and psychopathology, and the ability of self-compassion to differentially act as a buffer, it may be that level of self-compassion moderates the relationship between self-esteem and psychopathology. Within such a model the level of self-compassion would alter the degree to which individuals were reliant upon self-esteem as a way of generating positive emotion. In turn reliance upon self-esteem, with its temporal fluctuations (Thewissen et al., 2008) in positive affect, puts the individual at greater risk of increasing schizotypal symptomatology. This leads to the first research question in the study, which aims to determine whether self-compassion is a moderator of the relationship between self-esteem and schizotypy.

Both self-compassion and self-esteem demonstrate associations with psychotic symptomatology in clinical populations (Birchwood et al., 2000; Braehler et al., 2012; Garety et al., 2001; Laithwaite et al., 2009; Mayhew & Gilbert, 2008), and also strongly

associate with more general psychopathology (MacBeth & Gumley, 2012; Sowislo & Orth, 2013). In a synthesis of the literature the author outlined similarities between presentations of both low self-compassionate and individuals scoring highly in schizotypy in a range of cognitive and emotional domains (Freeman et al., 2011; Gilbert, 2009; Pickup 2006; Steel et al., 2002). In this way it could be that self-compassion represents an underlying vulnerability to schizotypy at a cognitive and emotional level. Further to this Fennel's (1999) model outlines how individuals low in self-esteem demonstrate a propensity towards over-estimation of their own weaknesses and under-estimation of their strengths in the face of stressors. Within both the Zubin and Spring (1977) and Raine (1999) models, exposure to environmental stress, and subsequent ability to adaptively cope with stressors, is theorised to govern the decompensation process. Given that fluctuations in self-esteem also demonstrate a direct affect upon ratings of non-clinical psychotic symptomatology (Thewissen et al., 2008) this provides further evidence that self-esteem may play an important role in the decompensation process. On the basis of this literature the author proposes an alternative model for understanding the relationships between the three constructs based upon a mediation model in self-compassion and schizotypy are related via self-esteem. This indirect route is posited given self-compassion has been demonstrated to act as a buffer in the face of stressors (Leary et al., 2007). Within this context it is likely that where such a process breaks down, it would lead to the development of a thinking style characterised over-estimation of an individual's own weaknesses and under-estimation of their strengths in the face of stressors. This forms the basis of the second research question in the study; does self-esteem act as a mediator in the relationship between self-compassion and schizotypy?

In order to further investigate the nature of the relationships between self-compassion and schizotypy it was of particular interest to determine what relationships exist between specific subscales of the schizotypy and self-compassion construct. In line with this the third hypothesis in the study is that there will be a negative relationship between the mindfulness subscale of the self-compassion measure and the unusual experiences subscale of the schizotypy measure. This hypothesis was made on the basis that taking a more mindful approach towards human experience, even anomalous experiences, is thought to reduce the likelihood of jumping to conclusions (Liddle & Morris, 1991; Sellen et al., 2005). In this way, those who more readily utilise such an approach may be less likely to jump to conclusions regarding anomalous experiences thereby reducing the likelihood that symptoms persist. Further to this it also tests the assertion made by several research groups using clinical populations (Abba, et al. Chadwick, et al., Ellett, et al, 2013) in which mindfulness interventions were found to reduce positive psychotic symptomatology – likely through reductions in associated distress. Within this context this would provide useful data in understanding whether there was a relationship between mindfulness and positive schizotypal symptoms throughout the continuum of psychosis.

Individuals with a propensity towards enduring negative self-judgements, akin to negative self-schemas are more likely to endorse feeling threatened by positive schizotypal symptomatology thereby maintaining such experiences (Freeman et al., 2001). As such the fourth hypothesis in the study is that the self-judgement subscale of the self-compassion measure will be positively correlated with the unusual experiences subscale of the schizotypy measure.

Within the Gilbert (2009) model of self-compassion evidence was presented which highlighted how social closeness, and contingent evaluations of such, plays a

central role in the aetiology of self-compassion. Social closeness, and more specifically the feeling of being cared for by another, demonstrated a significant correlation with psychopathology (Gilbert, 2008). Indeed social isolation was theorised to have both an aetiological and maintenance role in the development of schizotypy (Raine, 2006) and psychosis (Garety, et al., 2001; Morrison, 2000). It is therefore of interest to determine whether such a relationship exists throughout the continuum of psychotic experiences; using the schizotypy construct. Thus the fifth hypothesis in this study is that the isolation (i.e. reduced social closeness) subscale of the self-compassion measure will be positively correlated with the unusual experiences subscale of the schizotypy measure.

1.5.1 Research questions and hypotheses. The study will address the following specific research questions and hypotheses.

1.5.1.1 Hypothesis 1: There will be a negative correlation between total self-esteem and schizotypy scores.

1.5.1.2 Hypothesis 2: There will be a negative correlation between total self-compassion and schizotypy scores.

1.5.1.3 Research question 1: Does self-compassion moderate the relationship between self-esteem and schizotypy?

1.5.1.4 Research question 2: Does self-esteem mediate the relationship between self-compassion and schizotypy?

1.5.1.5 Hypothesis 3: There will be a negative correlation between the mindfulness subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.

1.5.1.6 Hypothesis 4: There will be a positive correlation between the self-judgment subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.

1.5.1.7 Hypothesis 5: There will be a positive correlation between the isolation subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.

Method

This section provides a summary of the procedures followed in the course of data collection and analysis within this study. The methodological framework is elaborated; justifying an appropriate means of collecting data to address the research questions. Demographic information regarding the participants is also presented in this section. The protocol followed for each participant is outlined followed by a description of each of the measures used. Finally, details of the planned statistical analyses are provided in relation to the research questions and hypotheses.

2.1 Design

All analyses utilised a cross-sectional, correlational design in order to determine the nature of the relationships between measures of self-compassion, self-esteem and schizotypy within a non-clinical population.

2.1.1 Hypothesis 1: *“There will be a negative correlation between total self-esteem and schizotypy scores.”* In the first hypothesis the first variable was total mean schizotypy score and the second variable was total mean self-esteem score.

2.1.2 Hypothesis 2: *“There will be a negative correlation between total self-compassion and schizotypy scores.”* For the second hypothesis the first variable was total mean schizotypy score and the second variable was total mean self-compassion score. Both hypotheses one and two were one-tailed.

2.1.3 Research question 1: Moderation analysis. *“Does self-compassion moderate the relationship between self-esteem and schizotypy?”* With respect to the first research question, the method is further outlined in the plan for analysis section. However, the outcome variable in this analysis was mean total schizotypy score, and the independent variables were: total mean self-esteem score (predictor) and total mean self-compassion score (moderator).

2.1.4 Research question 2: Mediation analysis. *“Does self-esteem mediate the relationship between self-compassion and schizotypy?”* With respect to the second research question the combined interaction effect of the two independent variables on the outcome variable was investigated. This method is outlined further in the plan for analysis section. The outcome variable in this analysis was mean total schizotypy score, the independent variables were: total mean self-compassion score (predictor) and total mean self-esteem score (mediator).

2.1.5 Hypothesis 3: *“There will be a negative correlation between the mindfulness subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.”* The first variable was total mean score on the unusual experiences subscale of the schizotypy measure and the second variable was total mean score on the mindfulness subscale of the self-compassion measure.

2.1.6 Hypothesis 4: *“There will be a positive correlation between the self-judgment subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.”* The first variable was total mean score on the unusual experiences subscale of the schizotypy measure and the second variable was total mean score on the self-judgement subscale of the self-compassion measure.

2.1.7 Hypothesis 5: *“There will be a positive correlation between the isolation subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.”* The first variable was total mean score on the unusual experiences subscale of the schizotypy measure and the second variable was total mean score on the isolation subscale of the self-compassion measure.

Hypotheses 3-5 were all one-tailed.

2.2 Participants

The target participants for the study were students (i.e. a non-clinical population). The full range of personality dimensions (schizotypy, self-esteem and self-compassion) were likely to be found within this sample. The sample size calculation, inclusion and exclusion criteria, response rate and participant characteristics will be discussed in this subsection.

2.2.1 Sample size calculation. For the correlational analyses planned in the study a sample size calculation was completed using Cohen's (1992) method for estimating sample sizes.

There is a paucity of literature investigating correlations between self-compassion and schizotypy, or indeed psychosis. As such the author chose to use data from previous research by Neff (2003), who used a cross-sectional study design in order to investigate the relationship between self-compassion (as measured using the self-compassion scale; SCS, Neff, 2003) and psychopathology (as measured using the State-Trait Anxiety Inventory; STAI, Spielberger, Gorsuch & Lushene, 1970). Neff utilised a sample of 391 University of Texas students (166 men, 225 women, mean age 20.91 years). The results of the correlational analyses revealed a strong negative correlation between total STAI scores and total SCS score ($r = .65$, $SE = .03$). This represents a large effect size when using Cohen's (1992) method for estimating effect sizes using Pearson's r . Further to this Cohen suggests that where power is set at .80, and $\alpha = .05$ and assuming a large effect size, the number of participants for this part of the study should be 28. Alpha level was set at .05 in order to detect statistically significant correlations between the variables in the study. A more conservative alpha level was not considered appropriate given the lack of previous research utilising the specific variables in this study.

2.2.2 Inclusion and exclusion criteria. The participants were an opportunity sample of students at the University of East Anglia's Norwich Medical School. Participants were recruited through advertising on the university email system. Inclusion criteria were any students within the Norwich Medical School who could be contacted by email. The school comprises undergraduate and postgraduate students enrolled in courses relating to medicine, clinical psychology, biomedical sciences, health economics, environmental health, and biological sciences. The non-clinical population was considered appropriate to test the hypotheses, in part because the constructs (self-esteem, self-compassion, schizotypy) demonstrate normal distributions throughout the general population.

There were no exclusion criteria for participation in the study. The potential for self-selection bias associated with recruiting in this way is high. However, several studies have compared the reliability and validity of web-based studies to identical studies carried out in the real world (Buchanan & Smith, 1999; Krantz, Ballard, & Scher, 1990). Other authors note the generalisability of results from web-based surveys could be low; given the inherent restriction that responders must be computer literate and have internet access (Wyatt, 2000).

2.2.3 Response rate. In all 1155 undergraduate and postgraduate students at the University of East Anglia's Norwich Medical School were approached to take part in the internet study. Of these 125 participants completed the on-line questionnaires. This gives a response rate of 10.8%.

2.2.4 Participant characteristics. Of the 125 participants who were recruited 32 data sets had to be removed from the main analysis due to incomplete data sets. Data sets were considered incomplete where two or more whole questionnaires were not completed. On this basis 31 data sets were removed from the main analyses. This

left 93 participants; all of whom completed three questionnaires, and with no missing data. These 93 complete data sets were used in the analyses. The mean age of the 93 participants was 26.11 years old (SD = 7.46). The majority of the participants described themselves as white British (75.5%) with the remaining participants consisting of white other (8.5%), white Irish (5.3%), Indian (4.3%), mixed (4.3%), other (1.1%) and black African (1.1%).

2.2.4.1 Excluded cases. Of the 32 participants who were excluded from the study due to incomplete data only five provided demographic data. These non-completers had a mean age of 22.28 years (SD = 4.66); lower than the total mean (26.11 years) which was based upon the 93 completers. Non-completers who provided demographic information comprised 57.1% female and 42.8% male participants. Of those non-completers who provided demographic information 57.12% described themselves as white British. Obviously firm conclusions cannot be made about the characteristics of the excluded participants given the very low sample size of those providing this information (N = 5).

2.3 Measures

The following self-report scales were chosen to measure global self-esteem, self-compassion and trait schizotypy. Test selection was guided by the literature discussed in the introduction. Tests were considered for inclusion in this study on the basis of i) psychometric properties, ii) extensive use in the literature to aid comparison with other research and iii) availability of test materials. The tests deemed suitable for inclusion were all free to use for research purposes and permission was granted from the authors to distribute them free of charge, and without infringement of any copyright issues for this use.

2.3.1 Schizotypy. Some measures of trait schizotypy that were considered for use in the study were based upon clinically-defined categorisations of SPD, such as the SPQ (Raine, 1991). Although such measures would have provided more clinically-relevant information about an individual's current risk of making transition to psychosis, it is likely results would have been significantly positively skewed. Others measures of trait schizotypy, based in a fully-dimensional approach, were also considered in chapter one. Notably, in this context was the O-LIFE (Mason & Claridge, 1995, Appendix A). This represents the most extensively used measure of this kind and has even demonstrated some limited utility in predicting transition rates to psychosis (Fenton & McGlashan, 1989). As such the O-LIFE measure would seem most appropriate for use in this study.

2.3.1.1 O-LIFE. The O-LIFE is a self-report measure based upon a fully dimensional approach to schizotypy. Schizotypal symptomatology are regarded in the same way as other individual traits such as anxiety or depression i.e. that they occur on a continuum through both clinical and non-clinical populations. Risk of transition to psychosis is considered elevated in those scoring highly on the measure. The measure has four subscales; unusual experiences, cognitive disorganisation, introverted anhedonia and impulsive nonconformity. Each item utilises a dichotomous response format (yes/no); items endorsed positively (i.e. a 'yes' response) score one point. Items endorsed with a no response are scored as zero. Several items in the scale are also reversed scored. Total scores on the O-LIFE can range from a minimum score of zero to a maximum score of 150. A total mean score is then calculated by dividing total score by four (the number of subscales in the measure). Thus total mean scores on the O-LIFE range from a minimum of zero to a maximum of 37.5. Increasing scores on the

measure indicate greater schizotypal symptomatology; with higher schizotypy representing those most at risk of making transition to psychosis.

The O-LIFE is the most widely used measure of schizotypy owing to its good psychometric properties. It reports high internal consistency (unusual experiences $\alpha = .89$, cognitive disorganisation $\alpha = .87$, introverted anhedonia $\alpha = .82$, and impulsive nonconformity $\alpha = .77$), and good test-retest reliability ($>.70$). A shortened version of the O-LIFE has been developed (40 items); however, due to the proposed subscale analyses in this study the original 104 item scale was considered more appropriate for use.

2.3.2 Self-compassion. Research into the development of scales to measure self-compassion is still in its infancy. To date Neff's (2003) Self-Compassion Scale (SCS; Neff, 2003, Appendix B) is regarded as a well-validated, and extensively used, measure of the construct (Neff, 2003; Neff & Vonk, 2009). However, this measure is based upon a more spiritual definition of self-compassion and has been criticized for its lack of scientific rigor (Gilbert, 2009). Gilbert (2005; 2009) was developing a measure of self-compassion, which more accurately reflects his own psychologically-grounded model of self-compassion. However, this measure has not yet been extensively empirically tested (Gilbert Clarke, Hempel, Miles & Irons, 2004, as cited in Gilbert, 2010). To date there have been a limited number of studies using Gilbert's scale with clinical and general populations (Gilbert & Proctor, 2006; Mayhew & Gilbert, 2008). As such the SCS is still considered the most appropriate measure for use in this study given its extensive use in the literature, which aids comparison with other research, and its well-validated psychometric properties.

2.3.2.1 Self-Compassion Scale (SCS; Neff, 2003). The SCS measures six subscales of self-compassion in individuals: common humanity, self-kindness,

mindfulness, self-judgment, over-identification and isolation. There are a total of 26 items each utilising a 5-point Likert scale (1 = “almost never” to 5 = “almost always”) to assess the recent frequency of occurrence of each item. Total scores range from a minimum of 26 to a maximum score of 130. Within the measure there are several negatively scored items in which scores are reversed. Total mean scores should then be derived by dividing total score by 6 (the number of subscales). Increasing mean scores on the SCS represent increasing levels of self-compassion.

The SCS has good construct validity; for example it does not significantly correlate with other constructs such as social desirability ($r = 0.05$, $p = 0.34$). It also demonstrates good internal consistency (ranging from $\alpha = .80$ to $\alpha = .62$ on the six subtests) and good test-retest reliability ($>.90$).

2.3.3 Self-esteem. The main issue in choosing a measure of self-esteem is in addressing the exact definition of the construct to be measured. In this study a measure of global esteem was chosen; the assumption being that this will provide a ‘snap-shot’ of an individual’s global positive and negative evaluations of their selves. The most widely utilised measure of global self-esteem is still the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965, Appendix C). The properties of this measure are discussed below.

2.3.3.1 Rosenberg Self-Esteem Scale (Rosenberg, 1965). The RSES is a 10-item scale for measuring global self-esteem. The questionnaire utilises a 4-point Likert scale for respondents to indicate the degree to which they agree or disagree with each question. The minimum score on the RSES is zero and the maximum score is 30. Higher scores on the measure represent greater levels of self-esteem in the individual. The scale demonstrates adequate test-retest validity ($r = .85$). It also demonstrates good construct validity evidenced by the significant correlations ($p < .05$) between self-

reported ratings and ratings by professionals and peers (Rosenberg, 1965). Although some studies have found the scale to be a valid and reliable uni-dimensional measure of self-esteem, Goldsmith (1986) asserts that the scale could be comprised of two factors dependent upon age and other characteristics of the sample. However, it is notable that in studies using high school or college students the scale's uni-dimensionality was supported (McCarthy & Hoge 1982, as cited in Goldsmith, 1986).

2.4 Ethical Considerations

Ethical approval for the study was gained through the University Of East Anglia Faculty Of Health Ethics Committee (Appendix D); who also provided the research governance for research using university populations. The methodology did not pose significant risk to participants, was non-invasive, and did not involve deception of any kind. However, the questionnaires included items relating to mood and mental well-being, as such all participants were provided with specific information about where they could obtain help regarding mental health issues (see Appendix E).

In order to protect the participants valid consent was sought by requiring participants to read to an information sheet (Appendix F) regarding the nature of the research, their involvement, and the potential risks and benefits to taking part. The information sheet was available for download. It could be printed and kept for future reference and participants were encouraged to do this. Further to this, participants were informed of their right to withdraw from participating in the research at any time during completion of the survey, without any negative consequences. Informed consent was assumed by participants' completion of the questionnaires.

In accordance with The Data Protection Act (1998) all steps were taken to preserve the confidentiality of data acquired throughout the course of this study. Since participants were invited to leave an email address, which was used to contact the

successful participant in a prize draw, this information was kept separately from their questionnaire data thereby ensuring anonymity. Data were not used for any other purpose other than the purpose for which it was collected and was stored securely.

2.5 Procedure

Participants from the Norwich School of Medicine were recruited by email. Potential participants receiving the email invitation to participation were directed to a website where they were asked to read an information sheet (Appendix F) discussing the research and their participation. Participants were assured of both confidentiality and anonymity, and of their right to withdraw their consent and involvement at any time before the completion of the survey without any negative consequences. Informed consent was assumed through participant's completion of the online questionnaires. They were encouraged to print the information sheet and keep this for future reference. Two reminder emails were sent to students, as is permitted by University regulations, inviting their participation in the survey. The web survey was closed after a period of two weeks in which no further participants were recruited. In all the survey was open for a period of 12 weeks. Consenting participants were asked to complete three measures: the O-LIFE, SCS and RSES, as well as some basic demographic data. To eliminate responder bias the order in which the questionnaires were presented was alternated to produce six different arrangements. After completing the questionnaires participants were directed to a list of useful contact numbers regarding mental health issues (Appendix E). Participants were encouraged to print this page and keep it for future reference. Finally participants were invited to leave their email address as a contact for use in a prize draw. The incentive (£50 online Amazon voucher) for taking part in the research was chosen because of its gender neutrality; in that it was equally attractive to both genders. The researcher contacted the successful applicant using their

email address and presented them with a £50 online voucher for Amazon. In this way the researcher had no face-to-face contact with any of the participants. If participants wished to contact the researcher regarding the study they had access to this contact information; however, in the course of the study no participants contacted the researchers.

2.6 Plan of Analysis

Data were analysed using IBM Statistical Package for the Social Sciences version 19 (SPSS; IBM, 2010). In the first instance the 93 completed data sets were explored using visual and descriptive data analyses. The data were examined for skewness and kurtosis properties and an examination of the assumptions for parametric testing were made. The plan for analysis corresponding to individual research questions and hypotheses are outlined in the following subsection.

2.6.1 Hypothesis 1. *“There will be a negative correlation between self-esteem and schizotypy.”* A bivariate Pearson’s correlation coefficient was calculated between total self-esteem scores and total mean schizotypy scores.

2.6.2 Hypothesis 2. *“There will be a negative correlation between schizotypy and self-compassion”* With respect to the second hypothesis a further bivariate Pearson’s correlation coefficient was calculated between total mean schizotypy scores and total mean self-compassion scores.

2.6.3 Hypotheses 3-5.

Total scores for the individual subscales of the O-LIFE and total scores for the individual subscales of the SCS were calculated. Following this bivariate Pearson’s correlation coefficients were then calculated between the six subscale totals of the SCS and the four subscale totals of the O-LIFE. Due to the fact that multiple correlations were being carried out a Holm’s sequential Bonferroni correction (Holm, 1979, cited in

Field, 2010) was performed in order to minimise the chances of Type I error. This method was used instead of a simple Bonferroni correction, which it has been claimed, is too conservative for correcting multiple comparisons (Field, 2010). Instead the Holm's method adjusts the significance level for n-paired comparisons, where each paired comparison is ranked from most significant to least. The formula, which is provided in appendix G, is then applied in order to achieve a corrected p -value. Where the original p -value is less than the corrected p -value, and falls below the $p = .05$ level, then correlated coefficients are said remain significant. For example the corrected p -value for first ranked paired correlation would be $p = .005$, then $p = .0055$, then $p = .006$ etc.

2.6.4 Research question 1. *“Does self-compassion moderate the relationship between self-esteem and schizotypy?”* This analysis involved determining the combined interaction effect of self-esteem and self-compassion upon the outcome variable; schizotypy. Figure 3 is a pictorial representation of the moderator effect proposed in this study.

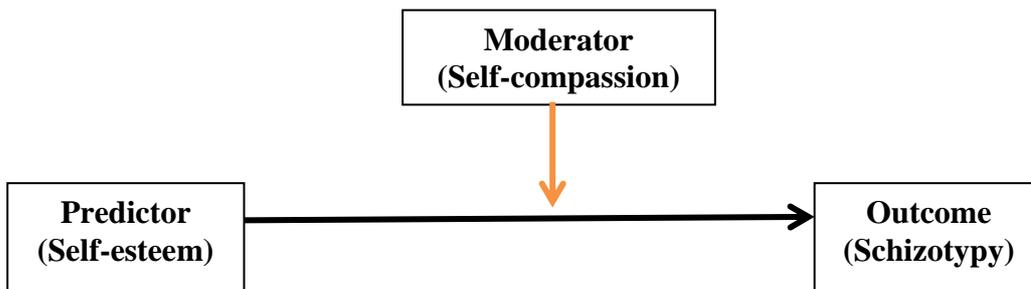


Figure 3. Diagram of conceptual moderator effect

Multiple regression using an interaction term calculated from centred variables is the method recommended by Field (2013) and Hayes (2013) for testing whether a variable acts as a moderator. This method maximises power by retaining the continuous nature of the variables. The PROCESS (Hayes, 2013) IBM SPSS statistics plug-in was used

to carry out the moderator analysis; however, the steps involved in the analysis will be outlined next.

2.6.4.1 Grand mean centering. In the first step of the procedure total mean self-compassion (moderator) and total self-esteem (predictor) scores were centered, using the grand mean-centering method (Field, 2013). In this method each score was taken and subtracted from the grand mean, thus all scores were centred around zero, allowing for more meaningful interpretation of the effect of self-compassion scores.

2.6.4.2 Multicollinearity. Grand mean centering is also used to reduce the impact of multicollinearity between variables which are highly correlated with each other. Previous research has demonstrated that self-esteem and self-compassion are highly correlated with each other (Neff & Vonk, 2009), as such, multicollinearity is likely to be an issue in this study. Multicollinearity amongst independent variables increases the risk of Type II error; thus incorrectly accepting a null hypothesis (Field, 2013). Field (2013) suggests guidelines for the assessment of multicollinearity in psychological research. Where the average Variance Inflation Factor (VIF) is above 1, then the regression model may be biased as a result of multicollinearity (Field, 2013).

2.6.4.3 Calculating the variable interaction term. The next step in the procedure was to calculate an interaction term based upon the centred variables. This involved multiplying total self-esteem scores by total mean self-compassion scores to produce the variable interaction term - self-esteem x self-compassion.

2.6.4.4 Forced-entry regression analysis. Finally a forced entry regression analysis was conducted in which the centered predictor (self-esteem) and moderator (self-compassion) and interaction term variable (self-esteem x self-compassion), were all entered into the regression model with schizotypy score as the outcome (dependent) variable. This method is mandatory in the PROCESS tool used for the moderation

analysis. The reason for this is given as “stepwise methods techniques are influenced by the random variability in the data and so seldom give replicable results if the model is retested” (Field, 2010, p. 322).

2.6.4.5 Simple slopes analysis. Following the regression analysis and in order to investigate the nature of any moderating effect in more detail a simple slopes analysis was conducted. In this way the regression equation for the predictor and outcome at low, medium, and high levels of the moderator are calculated. PROCESS uses 1 SD above and below the mean for the moderator (self-compassion) to represent high and low values respectively. The resulting slopes were then compared in terms of their direction and significance level in order to understand the nature of the relationship between the self-esteem (predictor) and schizotypy (outcome) at different levels of self-compassion (moderator).

2.6.5 Research question 2. “Does self-esteem mediate the relationship between self-compassion and schizotypy?” A mediation analysis outlined by Field (2013) and Hayes (2013) was utilised in this study. Figure 4 is a pictorial representation of the mediation effect proposed in the study.

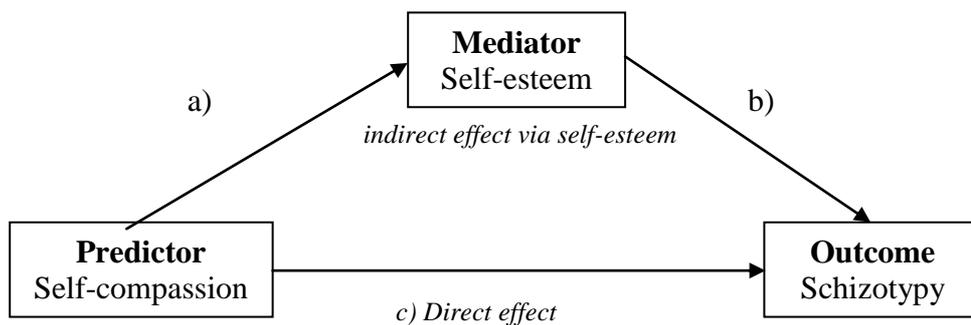


Figure 4. Diagram of conceptual mediation effect

The PROCESS (Hayes, 2013) IBM SPSS statistics plug-in was used to carry out the mediation analysis. The PROCESS analysis is based upon a logistic regression, path analytical framework, and can be used to estimate both direct and indirect effects

in simple and multiple mediator models. The method provides greater power than the causal steps method which is commonly used to investigate mediation (Baron & Kenny, 1986). The model tests the significance of the indirect (mediated) effect; computed as the product of the regression coefficient estimates ($a \times b$). Field (2013) suggests that the PROCESS tool method of utilising bootstrapping to estimate the confidence intervals of the effect size is a more robust methodology, which reduces the likelihood of making a type II error (accepting an incorrect null hypothesis). Bootstrapping is a resampling procedure which has been recommended for testing mediation because it has high power while maintaining control over type I error rate (Preacher & Hayes, 2008). The data is resampled 1000 times and regression equations relating to paths a) and b) in Figure 4 are run using the resampled data. Using 95% confidence intervals a sampling distribution of $a \times b$ is created. Significant mediation is deemed where these 95% confidence intervals do not contain zero. The mediated effect size can be compared to norms for the size of the indirect effect using the Preacher & Kelley (2011) κ^2 method. κ^2 is calculated from the observed mediated effect divided by the maximum possible mediated effect. Field (2013) outlines norms for κ^2 . For a large effect κ^2 value of .25, medium effect $\kappa^2 = .09$ and a small effect of $\kappa^2 = .01$.

Results

The following section is organised into six subsections comprising: i) excluded data sets ii) an overview of the descriptive statistics iii) correlation analyses regarding hypotheses one and two iv) moderator and mediator analyses regarding research questions one and two v) correlation analyses regarding hypotheses three to five and finally vi) a summary of the findings in this study.

3.1 Excluded Data Sets

In cases of partially completed questionnaires, where less than two questionnaires were completed, these data sets were removed from the main analyses. A total of 32 data sets were removed from the main analysis on this basis. This left a total of 93 participants who had completed all the data sets in the study - 25 male and 68 female.

3.2 Descriptive Statistics

All data were analysed using IBM Statistical Package for the Social Sciences version 19 (IBM, 2010). Table 2 summarises the descriptive statistics for each of the variables: schizotypy, self-esteem and self-compassion. Total mean scores on each measure, as well as subscale mean scores for the schizotypy and self-compassion measures are illustrated in the table.

Comparable total mean score for the SCS were found in this study with published norms (mean = 18.25, SD = 3.75; Neff, 2003). Neff (2003) utilised a similar population; students from the University of Texas, in order to produce the normed data for this measure.

Compared with published norms for the O-LIFE (mean = 8.26, SD = 5.35; Mason, Claridge & Jackson, 1995, as cited in Mason & Claridge, 2005) participants in

this study reported similar total mean scores. Mason et al. (1995) recruited from a similar sample - 1093 student volunteers at the University of Oxford.

Total RSES scores found in this study were very similar to published norms (mean = 18.63, SD = 6.30; Rosenberg, 1965), which utilised students from the University of Princeton.

Table 2

Descriptive Statistics

	N	Mean (SD)	Skewness (SE)	Kurtosis (SE)
<i>Self-esteem Measure</i>				
Total RSES	93	18.62 (5.50)	-.223 (.250)	.348 (.495)
<i>Self-compassion Measure</i>				
Total SCS	93	17.19 (4.34)	.025 (.250)	-.145 (.495)
Mean				
Self-Kindness	93	2.70 (0.81)	.584 (.250)	
Self-Judgement	93	3.34 (0.81)	-.139 (.250)	
Common Humanity	93	3.13 (.857)	-.134 (.250)	
Isolation	93	3.22 (1.01)	-.134 (.250)	
Mindfulness	93	3.19 (0.80)	-.126 (.250)	
Over-identification	93	3.24 (0.94)	-.127 (.250)	
<i>Schizotypal symptoms Measure</i>				
Mean Total O-LIFE	93	7.85 (3.61)	.919 (.250)	.102 (.495)
Unusual Experiences	93	5.59 (5.40)	1.650 (.250)	
Impulsive Non-Conformity	93	8.13 (3.85)	.465 (.250)	
Introverted Anhedonia	93	8.05 (3.53)	1.094 (.250)	
Cognitive Disorganisation	93	10.19 (5.78)	.440 (.250)	

Notes: Rosenberg Self-Esteem Scale (RSES), Self-Compassion Scale (SCS), Oxford-Liverpool Inventory (O-LIFE)

3.3 Distribution of Scores

As can be seen from Table 2, the distribution of total O-LIFE scores was positively skewed. Data are considered to be significantly skewed from normal when the value is close to +/- 1. This effect has been determined widely within schizotypy research (Rawlings et al., 2008). A Shapiro-Wilk test confirmed that the total O-LIFE scores were significantly skewed from normal. Attempts were made to transform data in order to obtain a normal distribution. This was successfully done using a log10

transformation, which was only applied to the O-LIFE variable in line with recommendations by Field (2013).

Following log₁₀ transformation of the total O-LIFE scores the skewness value was .073, with a standard error of .250, and the kurtosis value was -.671 with a standard error of .495. Converting the skewness and kurtosis values into z-scores allowed for the scores to be compared in the same units (Field, 2010). Post-log 10 transformation skewness and kurtosis z-score values were below 1.96; therefore, considered to be no longer problematic (Field, 2010).

Appendix H contains the histogram plots for the O-LIFE scores before and after log₁₀ transformation, indicating how normal distribution of the scores was achieved. Appendix I demonstrates O-LIFE scores before and after log₁₀ transformation on Q-Q normal plots. Box plots for transformed data are provided in Appendix J. Transformed data for the O-LIFE were used in all analyses unless otherwise specified.

3.4 Bivariate Analyses Exploring Hypotheses 1 and 2

Hypothesis 1: *“There will be a negative correlation between total self-compassion and schizotypy scores.”*

Hypothesis 2: *“There will be a negative correlation between total self-esteem and schizotypy scores.”* Bivariate Pearson’s correlation coefficients were calculated between total mean SCS score, total RSES scores and total mean O-LIFE scores. The results are depicted in Figure 3.

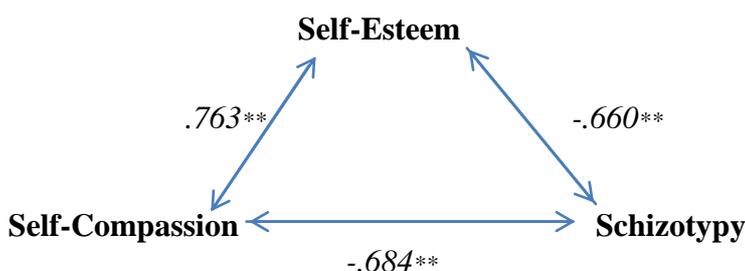


Figure 3. Summary of Pearson’s correlation coefficients (N = 93)

**correlation significant at the $p < 0.001$ level (1-tailed).

All variables were found to be highly significantly correlated with each other. As expected, self-compassion and self-esteem were positively correlated with each other. A negative correlation was also determined between schizotypy and self-esteem. Finally, the results of the initial correlational analyses also determined a negative relationship between schizotypy and self-compassion. As such, both hypotheses one and two were accepted in this study.

3.5 Research Question 1: Moderator Analysis

“Does self-compassion moderate the relationship between self-esteem and schizotypy?” As previously outlined, a method described by Field (2013) and Hayes (2013) was used to determine whether self-compassion acted as a significant moderator in the relationship between self-esteem and schizotypy. The PROCESS IBM SPSS statistics plug-in (Hayes, 2013) automatically centers each of the independent variables (total mean self-esteem and self-compassion scores) using the grand-mean centering procedure. In this method each score was taken and subtracted from the grand mean, thus all scores were centred around zero, allowing for more meaningful interpretation of the effect of self-compassion scores. It then calculated an interaction term using the grand mean-centred variables. Both the centered independent variables; predictor (self-esteem) and moderator (self-compassion), and the interaction term variable, were entered into a forced-entry regression model with schizotypy score as the outcome (dependent) variable.

3.5.1 Results of regression analysis. The results of the model summary suggest that self-esteem and self-compassion together predict 52.45% of the variance in total schizotypy scores ($F = 42.30$, $df = 3,89$, $p < .0001$). The results of the forced entry hierarchical regression analysis are presented in Table 3.

Table 3

Linear model of predictors of schizotypy

	β	SE	t	p
SCS	-.6651 [CI = -1.067, -.262]	.2027	-3.281	.0015
SES	-.5222 [CI = -.862, -.181]	.1713	-3.049	.0030
SES x SCS	-.7999 [CI = -2.155, .555]	.6821	-1.172	.2441

Notes: $R^2 = .52$.

There was a significant effect of both independent variables; self-esteem ($\beta = -.522$, $p = .003$) and self-compassion ($\beta = -.665$, $p = .001$). However, there was a non-significant effect of the interaction term (SES x SCS; $\beta = -.799$, $p = .244$). Therefore, self-compassion cannot be considered to act as a moderator of the relationship between self-esteem and schizotypy in this study. The non-significant result may have been affected by multicollinearity between the independent variables in this study. The average VIF was above 1 and the minimum tolerance level in this study was above 0.2; both of which are suggestive of multicollinearity being a potential problem in the regression model (Field, 2013). Within regression models there is an assumption independent variables are correlated with the outcome variable but not necessarily with themselves. In this study the two independent variables (self-esteem and self-compassion) are highly correlated with each other. Where multicollinearity presents a significant problem in a regression model there is increased likelihood of Type II error (Field, 2013).

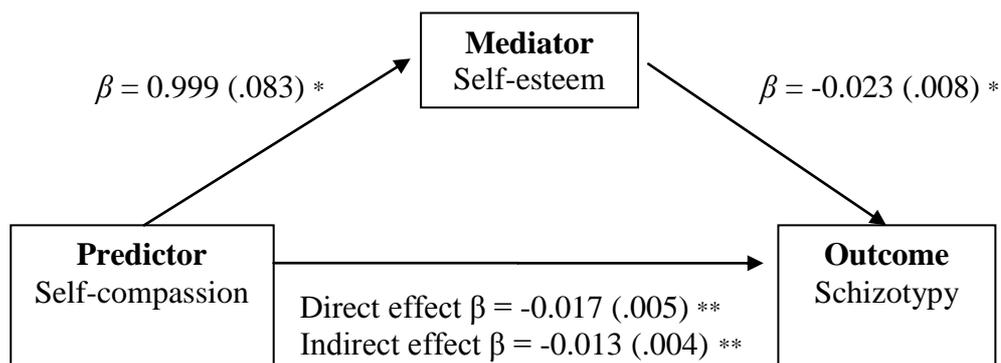
3.5.2 Simple slopes analysis. Since the regression model for the moderator analysis was non-significant a simple slopes analysis was not reported in this study.

3.6 Research Question 2: Mediation Analysis

“Does self-esteem mediate the relationship between self-compassion and schizotypy?”

As previously outlined, the method described by Field (2013) and Hayes (2013) was used to determine whether self-esteem acted as a significant mediator in the relationship between self-compassion and schizotypy. The PROCESS IBM SPSS statistics plug-in (Hayes, 2013) was utilised to conduct the analysis. The analysis was run in order to determine the size of the indirect effect and its related confidence intervals using the bootstrapping methodology outlined in an earlier chapter. Where confidence intervals include zero then mediation cannot be concluded. Where confidence intervals do not include zero then self-esteem can be considered a mediator in the relationship between self-compassion and schizotypy in this study.

The results of the regression analyses are presented in figure 4.



Notes: β = unstandardised regression coefficients, with standard error in parentheses. The CI represents a 95% BCa bootstrapped CI based on 1000 samples. ** = significant at the $p < .001$ level. * = significant at the $p < .05$ level.

Figure 4. Model of self-compassion as a predictor of schizotypal symptomatology mediated by self-esteem

There was a significant effect of self-esteem upon schizotypy ($\beta = -.023, t = -2.63, p = .01$). The negative direction of this effect indicates that as self-esteem scores increase schizotypy scores decrease and vice versa. Self-compassion also significantly predicted schizotypy scores with self-esteem in the model ($\beta = -.017, t = -3.17, p = .002$). The negative direction of the effect (of self-compassion on schizotypy) means that as self-compassion scores increase there is an associated decrease in schizotypal

symptomatology. The model (self-esteem with self-compassion) predicted 52.45% of the variance in schizotypy scores.

When self-esteem was controlled for in the regression model the total direct effect of self-compassion upon schizotypal scores remained highly significant ($\beta = -.031, t = -3.33, p < .001$). In this model self-compassion alone predicted 47.28% of the variance in schizotypal symptomatology. The indirect effect of self-compassion on schizotypy through self-esteem (mediation) was calculated to be $\beta = -.0132, [-0.021, -0.005]$. Since the confidence intervals for the effect do not contain zero, we can assume that self-esteem does act as a significant mediator in the relationship between self-compassion and schizotypy. This effect is considered to be a large effect ($\kappa^2 = .247, 95\% \text{ BCa CI } [0.100, 0.376]$). The results indicate that increased self-compassion was associated with lower ratings of schizotypy via self-esteem; however the direct effect of self-compassion upon schizotypy was also significant, i.e partial mediation was determined.

3.7 Analyses Investigating Hypotheses 3-5

Pearson's correlations were calculated in order to investigate the nature of the relationships between various subscales of the O-LIFE and the SCS. The results for all the correlations between the subscales are presented in Table 4. The correlations between the variables relating to hypotheses 3-6 are outlined in further detail next.

All subscales of the SCS were found to be highly correlated with each other, the same was true for all the subscales of the O-LIFE. Further to this, all the subscales of the SCS were significantly correlated with all the subscales of the O-LIFE.

3.7.1 Hypothesis 3. *“There will be a negative correlation between the mindfulness subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.”* In order to investigate Hypothesis 3 a Pearson's

Table 4

Correlation matrix for subscale analyses

N = 93	Self-Compassion Scale subscales					O-LIFE subscales			
	SK	SJ	M	OI	ISO	CD	IA	IN	UE
SK		-.668**	.645**	-.604**	-.573**	-.567**	-.292**	-.385**	-.252*
SJ			-.533**	.670**	.604**	.575**	.244**	.447**	.390**
M				-.645**	-.601**	-.515**	-.223*	-.317**	-.249*
OI					.702**	.612**	.205*	.333**	.290**
ISO						-.667**	.362**	.406**	.356**
CD							.372**	.460**	.540**
IA								.151**	.173**
IN									.429**

Notes: Self-compassion subscales; SK=self-kindness, SJ=self-judgement, M=mindfulness, OI=over-identification, ISO=isolation. O-LIFE subscales; CD=cognitive disorganisation, IA=introverted anhedonia, IN=impulsive non-conformity, UE=unusual experiences

** = highly significant correlation at the $p < .001$ level after applying Holm's Bonferroni correction * = significant correlation at the $p < .05$ level after applying Holm's Bonferroni correction

correlation coefficient was calculated between total scores on the mindfulness subscale of the SCS and total scores on the unusual experiences subscale of the O-LIFE. The results of the analysis determined that there was a significant negative correlation ($r = -.228, p = .02$) between the mindfulness subscale of the SCS and the unusual experiences subscale of the O-LIFE. As such the hypothesis three was upheld in the study.

3.7.2 Hypothesis 4. *“There will be a positive correlation between the self-judgement subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.”* In order to investigate Hypothesis 5, a Pearson's correlation coefficient was calculated between the self-judgement subscale of the SCS and the unusual experiences subscale of the O-LIFE. The results of the analysis

determined that there was a highly significant positive correlation ($r = .361, p < .0001$) between the self-judgement subscale of SCS and the unusual experiences subscale of the O-LIFE. As such hypothesis four was upheld in the study.

3.7.3 Hypothesis 5. *“There will be a positive correlation between the isolation subscale of the self-compassion scale and the unusual experiences subscale of the schizotypy measure.”* In order to investigate Hypothesis 4, a Pearson’s correlation coefficient was calculated between the isolation subscale of the SCS and the unusual experiences subscale of the O-LIFE. The result of the analysis determined that there was a highly significant positive correlation ($r = .330, p = .001$) between the isolation subscale of the SCS and the unusual experiences subscale of the O-LIFE. As such Hypothesis five was upheld in the study.

3.8 Post-Hoc Analyses

Given the predominance of female participation in the study post-hoc analyses to determine between groups effects based upon demographics seemed particularly warranted. Repeated correlational analyses between the three variables in the study were conducted after stratifying for age and gender. The results are summarised in Appendices K-N. The highly significant correlations between the variables remained. One way ANOVA revealed no significant differences between the genders on measures of self-compassion ($F = 1.624, p = .206$), total self-esteem score ($F = 0.010, p = .923$) or total schizotypy score ($F = 3.917, p = .051$). In addition no significant differences were found between the age groups (under 25 years and over 26 years) on measures of total self-compassion score ($F = 2.47, p = .118$), total self-esteem score ($F = 4.717, p = .320$) or total schizotypy score ($F = .742, p = .391$).

3.9 Summary of Results

As expected, highly significant positive correlations were found between self-compassion and self-esteem scores. Further to this highly significant negative correlations were also determined between schizotypy and self-compassion, and between schizotypy and self-esteem. Therefore, hypotheses one and two were upheld in this study. With respect to the first research question; self-compassion was not found to be a significant moderator of the relationship between self-esteem and schizotypy. Although, it is noteworthy that there was high degree of multicollinearity between the independent variables (self-esteem and self-compassion), which may have increased the likelihood of Type II error in this part of the study. Regarding research question two, self-esteem was found to be a significant mediator in the relationship between self-compassion and schizotypy.

With respect to hypotheses 3-5, these were all upheld. There was a significant negative correlation between the mindfulness subscale of the SCS and the unusual experiences subscale of the O-LIFE. A positive correlation was determined between the isolation subscale of the SCS and the unusual experiences subscale of the O-LIFE. Further to this there was a positive correlation between the self-judgment subscale of the SCS and the unusual experiences subscale of the O-LIFE. The theoretical and clinical implications of the results are discussed in the following section in the context of the research literature previous outlined.

Discussion

The discussion is split into five subsections. The first subsection outlines a summary of the results, which are discussed within the context of relevant literature. Next the strengths and limitations of the current research are described, followed by the clinical implications and finally, future research themes are suggested.

4.1 Summary of Findings

Highly significant negative correlations were found between total self-compassion and total schizotypy scores; suggesting that higher self-compassion scores were associated with lower schizotypal symptomatology. As predicted, a highly significant negative correlation was also determined between self-esteem and schizotypal symptoms. This result indicated that as self-esteem scores increased there was a correlated decrease in schizotypal symptomatology.

Two mechanisms, through which self-compassion self-esteem and schizotypy could be related, were investigated in research questions one and two. Self-compassion was not found to be a significant moderator of the relationship between self-esteem and schizotypy. However, the impact of multicollinearity between the variables was likely to have increased Type II error, which may have been responsible for acceptance of the null hypothesis in this study. With respect to the mediation analysis although there was a significant indirect effect of self-esteem a direct effect of self-compassion on schizotypy was also determined i.e. partial mediation. This was the first study to investigate the nature of the relationships between self-esteem, self-compassion and schizotypy and to propose a mechanism through which the constructs may be related i.e. partial mediation.

Within the subscale analyses; significant correlations were determined between all the subscales of the SCS and subscales of the O-LIFE. With respect to the specific

subscale hypotheses made in this study a significant negative correlation was found between the mindfulness subscale of the SCS and the unusual experiences subscale of the O-LIFE. Moreover, a highly significant positive correlation was also found between the isolation subscale of the SCS and the unusual experiences subscale of the O-LIFE. As was predicted, highly significant positive correlations were also found between the self-judgement subscale of the SCS and the unusual experiences subscale of the O-LIFE. Whilst previous studies have highlighted reduced self-compassion in individuals recovering from psychosis, this study is the first to the authors' knowledge to highlight a link between psychotic-like experiences and self-compassion prior to the onset of psychosis using schizotypy as an analogue of the psychosis continuum.

The cross-sectional design of the study intended to provide direction for future research and determine whether relationships exist between the variables, as they were shown to clinical populations, within a continuum of psychosis framework. The theoretical implications of the results are discussed in the following subsection.

4.2 Relevance to the Literature

In this section the results of the current study will be discussed in terms of their relevance to the literature outlined in chapter one.

4.2.1 Hypothesis 1. *“There will be a negative correlation between self-esteem and schizotypy.”* A highly significant negative relationship was found between self-esteem and schizotypy in this study. This means that increases in self-esteem were significantly associated with decreases in schizotypal symptoms. Within clinical populations, previous literature had implicated self-esteem as an important factor in the development (Garety et al., 2001; Smith et al., 2006), and maintenance of psychosis (Birchwood et al., 2000). Within non-clinical samples both Thewissen et al. (2007) and Lieberman and Robertson (2005) demonstrated that schizotypal symptomatology

associated highly with self-esteem. This was also confirmed through epidemiological data gathered by van Os (2000). Thus the result of hypothesis two adds support to the research outlining the role which self-esteem may play in schizotypal symptomatology.

The cross-sectional design of the current study means no conclusions can be made about whether self-esteem plays a role in schizotypal symptom development or occurs as a result of exposure to increasing schizotypal experiences. From a theoretical perspective, self-esteem as a risk factor in the development of schizotypy could be understood through the findings from the Thewissen et al. (2008). Here temporal fluctuations in self-esteem were demonstrated to associate with real-time increases in schizotypal symptomatology (Thewissen et al., 2008). Fennel (1999) asserts that in the pursuit to maintain positive affect, and protect them from being exposed to the 'bottom line'; individuals engage in behaviours and a cognitive set which is marred by cognitive, emotional and interpersonal dysfunction. Within non-clinical populations, similar biases in cognition and emotional reactivity have been demonstrated to increase the likelihood of anomalous experiences (Freeman, et al., 2011; Langdon & Colthart, 1999; Lewandowski et al., 2006; Pickup, 2006; Steel et al., 2002). However, this mechanism remains untested in the current study since the variables necessary to support this view were not directly tested, as well as the cross-sectional nature of the study design.

Literature was also outlined which provided a framework for understanding self-esteem as a consequence of schizotypal experiences. Within such an approach those experiencing schizotypal symptomatology may be subjected to stigmatising views and threats to their self-esteem. This viewpoint has been asserted within clinical populations (Birchwood et al., 2000) but remains relatively untested within schizotypal populations. Some may argue that some level of stigma could be inferred from the

perceived deficits in social skills noted in high-scoring schizotypes (Lieberman & Robertson, 2005). In all likelihood both mechanisms may be relevant; self-esteem as a risk factor in the development of, and as a consequence of schizotypal symptomatology. The finding that self-esteem is negatively correlated with schizotypy provides a framework for further research in this area.

4.2.2 Hypothesis 2. *“There will be a negative correlation between self-compassion and schizotypy.”* The result in this part of the study determined a highly significant negative correlation between self-compassion and schizotypy. That is, as self-compassion scores increased there was an associated decrease in schizotypal scores. This result mirrors findings in clinical populations within small scale clinical trials of CFT for psychosis (Braehler et al., 2012; Laithwaite et al., 2009; Mayhew & Gilbert, 2008), thus demonstrating the effect throughout the continuum of psychotic experiences. Within treatment models CFT acts to target emotional dysregulation, shame and stigma, which have been implicated in cognitive models of the aetiology (Garety et al., 2001) and recovery from psychosis (Abba et al., 2008; Gumley, et al., 2010). The finding that self-compassion was negatively associated with schizotypy goes some way in demonstrating that similar associations are demonstrated throughout the continuum of psychosis using schizotypy as an analogue of psychosis. However, participants in the study were not followed up to determine whether any made transition to psychosis, and further to this the study design was cross-sectional. As such conclusions cannot be made about whether self-compassion reflects an inherent risk factor in the decompensation process, or indeed whether low self-compassion is a consequence of exposure to increasing schizotypal experiences.

One way of understanding self-compassion as a risk factor in the development of schizotypy is through the similarities in cognitive and emotional dysfunction. Here

the implication would be that such similarities may represent self-compassion as a factor underlying schizotypal symptomatology development. Within Gilbert's (2009) model of self-compassion the three affect regulation systems are posited to be in balance when one affect system does not have retrieval advantage over the others. Where the capacity to self-soothe is under-developed it leads to the possibility of an over-development of the threat affect system. The result is a propensity towards heightened threat monitoring, reduced affiliation with others and emotional dysregulation. Heightened threat monitoring in high schizotypes has been demonstrated by Freeman et al. (2011) and Green et al. (2003) adding some support to notion that similar processes may underlie both constructs. Further to this, reduced affiliation with others is another characteristic of low self-compassionate and high schizotypes; indeed interpersonal difficulties are one of the hallmarks of a schizotypal presentation (APA, 2000; Lieberman & Robertson, 2005). Problems with emotional dysregulation, including high rates of co-morbid anxiety and depression have been found in both low self-compassionate (MacBeth & Gumley, 2012; Neff, 2003) and high-scoring schizotypal individuals (Lewandowski et al., 2006). The aim of the current study was to provide a synthesis of the literature and examine whether there was any evidence of a relationship between self-compassion and schizotypy. In realising the association a further aim was to identify a focus for future research in this area. The underlying similarities in cognitive and emotional sequelae outlined in the review of the literature may provide a useful starting point in this endeavour.

The cross-sectional design of the current study means that reduced self-compassion as a consequence of increasing schizotypal experiences must be considered as an equally likely outcome. Within this framework exposure to increasing anomalous experiences (increased schizotypy) could erode an individuals' ability to act self-

compassionately. However, this mechanism would appear to be less theoretically sound given that Neff (2003) and others (Gilbert, 2009) suggest that self-compassion is a relatively stable trait; having its roots in early attachment behaviours.

Another consideration in respect of the result is that the negative correlation between self-compassion and schizotypy may only be apparent within a 'healthy schizotype' (Claridge, 1997) population. It is likely that the population utilised in this study; given their level of functioning, are more representative of healthy schizotypes than those at high risk of making transition to psychosis. From this perspective the decompensation process to psychosis may not be reflected by those mechanisms found in healthy schizotypes.

4.2.3 Research question 1: moderation analysis. *“Does self-compassion moderate the relationship between self-esteem and schizotypy?”* There is a well-established link between self-compassion and self-esteem (Neff & Vonk, 2009), although when self-esteem is controlled for self-compassion remains a significant predictor of psychopathology (Neff, 2003). This has led some to conclude that self-compassion, over self-esteem, may act as a buffer against impending psychopathology when exposed to stressful situations (Leary et al., 2007; Neff, 2003). However, there is also evidence that temporal fluctuations in self-esteem can influence low-level psychotic symptomatology (Thewissen et al., 2007). Within the three affect regulation model Gilbert (2009) suggests that low self-compassionate individuals are more likely to rely upon a striving/ achievement system (akin to self-esteem) for positive affect. The author therefore argued that level of self-compassion, having an impact upon subsequent reliance on self-esteem, may moderate the relationship between self-esteem and psychopathology, specifically schizotypy. In this way level of self-compassion was

asserted to alter the strength of the relationship between self-esteem and schizotypal symptomatology.

The results of the moderator analysis in this study found that self-compassion did not moderate the relationship between self-esteem and schizotypy. From the regression analysis it was clear that self-compassion added more predictive power than self-esteem in explaining the variance associated with schizotypy scores. Self-compassion uniquely contributed to almost half (47%) of the variance in schizotypal scores. However, self-compassion was not found to alter the strength or size of the relationship between self-esteem and schizotypy. Several explanations for the non-significant moderation result can be proposed. The first explanation could be that there are other mechanisms, and/ or other variables missing from the model, which would explain the nature of the relationship between self-compassion, self-esteem and schizotypy. Secondly, it may be that the non-significant result is due to methodological issues; relating to multicollinearity between the independent variables.

Multicollinearity increases the likelihood of Type II errors being made and thus wrongly accepting the null hypothesis. The issue of multicollinearity in this study was found to be a potential problem; therefore, the null hypothesis may have been incorrectly accepted in this case. Had the same non-significant result been demonstrated in the absence of multicollinearity issues, this could have indicated that other variables, or models not tested here, may have been responsible for the relationship between self-esteem, self-compassion and schizotypy. Other variables, not included in this model, which are implicated from the clinical literature include: affect, exposure to childhood trauma, and negative self-schemas. The potential moderating effect of self-compassion on the relationship between self-esteem and schizotypy remains an attractive prospect for future research given the theoretical grounding

outlined in this study. If a moderating mechanism were established in future research this could represent a fruitful area of research in understanding schizotypal symptomatology development or indeed decompensation to psychosis.

4.2.4 Research question 2: mediation analysis. *“Does self-esteem mediate the relationship between self-compassion and schizotypy?”* The results of the mediation analysis revealed that the relationship between self-compassion and schizotypy was partially mediated by self-esteem. The results were suggestive of both a direct route, and indirect route through self-esteem, through which self-compassion is related to schizotypy. This is the first piece of research which has demonstrated a mechanism by which these three variables may be related.

From the literature presented earlier the direct route was hypothesised to result from the similarities in both aetiology, and cognitive and emotional markers of low self-compassion and schizotypy. Both have been linked to exposure to childhood adversity (Myin-Germeyes et al., 2005; Raine, 2006), and similar cognitive and emotional dysfunction (Langdon & Colthart, 1999; Lewandowski et al., 2006; Pickup, 2006; Steel et al., 2002). Indeed such a model has similarities with models of psychosis (Garety et al., 2001), in which underlying cognitive vulnerabilities are considered precursors to the development of psychosis. One example of how this direct route may operate could be that in low self-compassionate individuals the ability to recognise and address pain and suffering both in oneself and others is impaired, akin to reduced ToM. Both Pickup (2006) and Langdon and Colthart (1999) have demonstrated ToM deficits in high schizotypes. As such a direct route by which self-compassion and schizotypy may be related could result from inherent deficits in ToM. Although the current study design does not provide all the necessary evidence to support this proposed mechanism,

it does provide direction for future research, which was the aim of this exploratory study.

Evidence of a direct route through which self-compassion and schizotypy are related also substantiates findings within the clinical literature. The association between self-compassion and psychosis has been established within clinical populations (Braehler et al., 2012; Garety et al., 2001; Laithwaite et al., 2009; Mayhew & Gilbert, 2008). In this way the direct route found in the mediation analysis provides some evidence of the continuum psychosis; given it mirrors associations found in clinical populations. To date this is the first piece of research in which this association has been demonstrated.

With respect the indirect route; self-compassion and schizotypy were also found to be related via self-esteem. This provides some support for the potential mechanism outlined in an earlier section. The proposed mechanism was one in which self-compassion conferred risk towards, or protection from, utilising self-esteem as a way of generating positive affect (Gilbert, 2009). In turn fluctuations in self-esteem were demonstrated to influence low-level psychotic symptomatology (Thewissen et al., 2008). As such an indirect to schizotypy could be represented by the influence which self-compassion has on the under- or over- utilisation of self-esteem. Moreover within a continuum approach to psychosis the result also establishes self-compassion and self-esteem as potential underlying mechanisms in schizotypal symptomatology; as has been shown in clinical populations (Birchwood et al., 2000; Braehler et al., 2012; Garety et al., 2001; Laithwaite et al., 2009; Mayhew & Gilbert, 2008). To date this is the first evidence that both self-compassion and self-esteem may have a role in schizotypal symptomatology. Specifically the result provides an early indication that self-

compassion may have a direct association with schizotypy, and an indirect route through self-esteem.

4.2.5 Hypotheses 3-5. Another aim of the research was to investigate the specific relationships which the subscales of the schizotypy construct had with subscales of self-compassion. In doing so the results were intended to address the problems associated with other research in the field, in which there has been a concentration upon research into positive schizotypal symptomatology (Rawlings et al., 2011). As a consequence of the dearth of previous research into the negative schizotypal symptomatology; specific directional hypotheses could not be made in this study. However, it was notable that significant correlations were found between all the subscales of the SCS and the subscales of the O-LIFE. The subscale analyses relating to the specific hypotheses made in this study will now be discussed in more detail.

4.2.5.1 Hypothesis 3. A significant negative correlation was found between the mindfulness subscale of the SCS and the unusual experiences subscale of the O-LIFE. It was asserted that a mindful approach allows for acceptance of all human experience within a context of curiosity (Neff, 2003) rather than searching for meaning, jumping to conclusions, and making biased assumptions about anomalous experiences (Freeman et al., 2011; Garety et al., 2001). This result adds some tentative support to the Freeman et al. (2011) study in which increased likelihood of jumping to conclusions in response to neutrally presented information was associated with higher ratings of positive psychotic-like experiences (paranoia) within a non-clinical sample. Although not experimental in design, the current study showed that there was a strong association between increasing mindfulness and lower schizotypal symptomatology.

One way of understanding this result could be that mindful acceptance of anomalous experience may influence distress and emotional dysregulation (Abba et al.,

2008; Chadwick et al., 2005; Dannahy et al., 2011; Ellett, 2013). Within clinical populations emotional changes in response to anomalous experiences have been shown to influence their content and are implicated in the development and maintenance of positive psychotic phenomenology (Garety et al., 2001). Mindfulness approaches focus upon reducing distress through a non-judgemental acceptance of experience and sensations (Neff, 2003). Thus, those able to take a more mindful approach may be less likely distressed by anomalous experiences. The associated reduction in distress could thereby impact upon the development of further positive symptomatology and indeed reduce the maintenance of current anomalous experiences. The current study did not employ a measure of distress, which would have aided conclusions about whether there was an indirect effect of distress upon the nature of the relationship between mindfulness and positive symptomatology. The indirect effect of distress on the relationship between mindfulness and positive symptomatology is another area which warrants further investigation. This study is the first to demonstrate a correlation between mindfulness and the unusual experiences of schizotypy, which mirrors associations found within clinical populations.

Alternatively, the correlation between mindfulness and unusual experiences could be understood through a mechanism in which increasing positive schizotypal symptomatology diminishes an individual's ability to utilise mindful approaches. Here anomalous experiences could be proposed to interfere with the use of mindful approaches due to the fact that they may be inherently distracting.

4.2.4.2 Hypothesis 4: A highly significant correlation was found between the unusual experiences subscale of the O-LIFE and the isolation subscale of the SCS. This finding adds support to the role which social isolation may play in schizotypal presentations (Lieberman & Robertson, 2005) and psychosis populations (Garety et al.,

2001) within a continuum approach. As with previous findings in this study the direction of the relationship cannot be addressed; therefore, several mechanisms must be considered to understand this finding. It may be that reduced affiliation/ social isolation conveys risk towards the development of positive symptomology through the development of specific cognitive biases, as suggested within the Garety et al. (2001) model of positive psychotic symptomology. Within this framework isolation leads to diminished ability to engage in reality testing; increasing the likelihood that explanations for unusual experiences would include socially unacceptable views.

Alternatively, the finding could also be understood from an exposure to stigma view point. Evidence form clinical populations suggests that increasing positive symptomology leads to increased exposure to stigmatising social views (Birchwood et al., 2000). Thus, within this framework individuals may isolate themselves for protection from stigma and social humiliation. Longitudinal studies which can address the mechanism by which isolation either results from experience of psychotic symptomatology (stigma viewpoint), or is a risk factor in the development of positive symptomology is certainly needed. An important factor, which this study does begin to address, is the notion of whether the relationship between isolation and positive symptomology is an artefact of the disease process itself. In utilising a non-clinical sample the current study demonstrates that the positive correlation between these two variables occurs throughout the continuum of psychotic experiences and prior to the onset of psychosis.

4.2.4.3 Hypothesis 5: With respect to the final subscale analysis a highly significant positive correlation between the self-judgment subscale of the SCS and the unusual experiences subscale of the O-LIFE was determined. This result mirrors findings within clinical samples; as implicated in cognitive models of psychosis

(Birchwood et al., 2000; Garety et al., 2001). The result in relation to hypothesis five indicates that a propensity towards making negative self-judgements and its relationship to positive schizotypal symptoms is not an artefact of a psychotic disease process. Within cognitive models of psychosis negative self-schemas, perhaps encompassing negative self-judgements, contribute towards the development of cognitive biases implicated in positive symptomology particularly delusional belief aetiology (Garety et al., 2001). Therefore, the result of hypothesis five provides some tentative evidence that a similar association is found within the continuum of psychotic experiences utilising the schizotypy construct. The result is also consistent with the prospective study by van Os et al., (2000); in which individuals with negative self-schemas measured at baseline were statistically more likely to go on to develop psychotic illness within the three-year follow-up period.

Alternatively, there is also the possibility that increasing exposure to unusual experiences results in more negative self-judgements. The cross-sectional nature of the study design does not provide any evidence to support the nature of causality in respect to the result. As such this alternative perspective is equally as likely to account for the result of hypothesis five.

The current study has provided data linking self-compassion, self-esteem and schizotypy. Within the clinical research domain, much of the research literature has concentrated upon the role which self-compassion may play in recovery from psychosis; particularly in targeting residual negative symptomatology. The current study has provided some evidence that the three constructs are related prior to the onset of psychosis utilising the schizotypy construct as an analogue of psychosis. The relative strengths and weaknesses of the study are considered in the next section.

4.3 Strengths and Limitations of the Study

4.3.1 Design. As outlined previously the cross-sectional design of the study means that conclusions about causation cannot be determined from this research. Although significant correlations were found between self-compassion, self-esteem and schizotypy, and indeed between the subscales of the SCS and O-LIFE, no assumptions about the nature of the influence that these have upon each other can be made. Similarly, the study used a single time point data collection; therefore, the relationships found must be assumed only stable at this time point. Clearly this limits the generalisability of the findings because it cannot be assumed that the findings would be replicated at different time points. The aim of this preliminary research was in the first instance to determine whether such relationships existed; thus guiding future research. Future study designs in this area should concentrate on longitudinal, experimental, and/or experience-sampling methodologies in order to overcome the limitations of the current study design.

4.3.2 Sample. Specific limitations to the study are associated with the sample used: the non-clinical population, their age, gender, ethnicity, and educational level, response rates in the study as well the inherent responder bias. These issues are discussed in greater detail in the following subsection.

4.3.2.1 Non-clinical sample. The study utilised a non-clinical undergraduate and postgraduate student population. It is accepted that the sample chosen is not entirely representative of the general population at large, nor it is representative of a clinical psychotic population. However, given the paucity of previous research in comparing the variables in question, it was deemed appropriate to utilise a non-clinical sample in order to provide data which would justify future research in this area. This is particularly important in preliminary and exploratory research, such as in this case, in order to protect clinical samples from being utilised unnecessarily. Further to this,

evidence was outlined which supported the use of the schizotypy construct to represent the continuum of psychosis (Freeman, et al., 2011; Langdon & Colthart, 1999; Lewandowski et al., 2006; Pickup, 2006; Steel et al., 2002; Steel et al., 2005). However, the notion that schizotypy can be utilised as an analogue of psychosis is not endorsed by all researchers in the field (Eysenck & Eysenck, 1997). As such the relevance of the current results to clinical populations cannot be assumed. Indeed where a fully-dimensional approach to schizotypy is endorsed the results may even explain more about the types of associations found between variables in a ‘healthy schizotype’ as opposed to having clinical relevance. Despite this caveat, the presence of trait schizotypal symptomatology has demonstrated some efficacy in predicting transition rates to psychosis (Fenton & McGlashan, 1989; Schultz & Soloff, 1987).

Another issue of relevance to the sample is that of the positively skewed scores on the O-LIFE measure. This indicated that respondents were more likely to endorse fewer schizotypal experiences. This is in line with previous research which demonstrated scores on measures of trait schizotypy, in non-clinical populations, are often positively skewed (Rawlings et al., 2008). Within a fully-dimensional approach it could be argued that the participants in the current study represent a particularly low risk for transition to psychosis. However, where a quasi-dimensional approach is endorsed Meehl (1962) would argue that even those low scorers could be at risk for making transition to psychosis given the right environmental conditions. It seems unlikely that the sample utilised are representative of a clinical sample; given their high functioning. Instead, the sample may better fit with the description of the ‘healthy schizotype.’ However, the lack of longitudinal data in this respect makes it difficult to rule this out entirely. This limits the generalisability of the results to clinical samples,

in particular to those at UHR of psychosis. It may be that the variables identified in the current study are not implicated in the decompensation process in high schizotypes.

Further to this, the reliability of any parametric statistical analyses are dependent upon the degree to which the sample distribution is considered normal. In contrast to the logarithmic method utilised to transform the O-LIFE data, the author also considered deleting outliers as methodology for achieving normality whilst retaining the assumption of linearity. However, the disadvantage of utilising this method in the current sample was in losing observations in an already small sample size. Since most parametric statistical procedures are not substantially affected in cases where the assumption of normality is not exactly satisfied (Field, 2010) the log transformation process was considered most appropriate. However, the extent to which the O-LIFE data were skewed does bring into question the generalisability of the results beyond this particular sample. Replication of the results found in this study in future studies would begin to overcome this issue.

4.3.2.2 Age. Recruitment to the study involved seeking participation from both undergraduate and postgraduate students at the Norwich Medical School. In this way the author hoped to recruit from a wider pool of students of different ages. This was deemed important in this study because some authors believe that young adults exhibit less stable personality traits and have less well-developed social identities than older adults (Alwin, Cohen & Newcomb, 1991). Further to this, the peak age of onset of psychosis is greater in women (25 years and above) than for men (17-25 years) (Rajji et al., 2009). The importance of recruiting participants to reflect this difference would more accurately capture the continuum of psychotic experiences in both genders.

Initial analyses revealed that 58.1% of survey-completers were aged below 25 years. This indicated that the recruitment strategy was successful since there was a

fairly even distribution of ages. A series of one-way ANOVAs revealed that there were no significant differences on any of the measures between those aged under 25 years and those aged over 26 years old. When stratifying for age, the highly significant correlations between the three measures in the study remained highly significant.

4.3.2.3 Gender. There was a bias towards female participation (71%) in the study. This could reflect a bias in the self-selection process where women found the study more appealing than did male participants. The study design went some way in ensuring the study was equally attractive to both genders; for example in choosing a gender-neutral prize. One-way ANOVA analyses revealed no significant effect of gender on any of the measures: self-esteem, self-compassion and schizotypy. Further to this, when the correlations between the variables were repeated after stratifying for gender they remained highly significant and negatively correlated in both groups. This would suggest that the results from the total sample were not significantly affected by the bias towards female participation in this study and, therefore, can be equally generalisable to both genders. However, future research should certainly concentrate upon the equal recruitment of males and females in order to examine gender effects within a larger population.

4.3.2.4 Ethnicity. The majority of the participants who completed all the data sets described themselves as white British (75.5%) with the remaining participants consisting of white other (8.5%), white Irish (5.3%), Indian (4.3%), mixed (4.3%), other (1.1%) and black African (1.1%). The University of East Anglia's own population statistics suggest that 16% of all students at the university are from outside the UK (HESA, 2010). This provides some tentative evidence that the ethnic diversity of the population was greater than would be expected, thus making the results more

generalisable to diverse ethnic groups. However, the samples were too small to conduct separate statistical analyses in order to explore this.

4.3.2.5 Educational level. The study recruited university students; as such the educational attainment of the population is skewed towards those having at least 13 years of education. This sample, therefore, is not entirely representative of the population at large. Further to this since educational attainment was not controlled for in this study the generalisability of the results to a more representative sample cannot be assumed. However, it is worth noting that the measures used in the study have been validated for use with general adult populations. It can therefore be assumed that the participants in this study would have had no problems in responding to the items on the scale. Further to this, Neff (2003) suggests that there are no differences in rates of responding on the self-compassion scale between student populations and more general adult populations.

4.3.2.6 Response rate. The response rate in this study was low (10.82%); although comparable with other internet-based studies (Hewson, Yule, Laurent & Vogel, 2003). It is possible that the low response rate was associated with attractiveness of the study to a wide population. The study had a significant time burden; taking around 30-45 minutes to complete all the questionnaires. The order in which the measures were presented to participants was alternated automatically to produce six different arrangements in order to reduce responder bias. One measure in particular took longer to complete (O-LIFE); it is possible that there was a bias towards non-completion in those responders who began the study with this measure.

Research suggests that more targeted recruitment improves response rates (Fricker & Schonlau, 2002); however, given the exploratory nature of this study a more targeted recruitment was not justified. Further to this, an internet study was chosen to

protect anonymity and to cause the least amount of inconvenience to participants.

Participants were able to access the survey at a time and place which suited them and did not have to complete all the questionnaires in one session. In this way, the author hoped to increase the attractiveness of the study to a wider range of respondents compared with face-to-face recruitment.

The timing of recruitment was originally planned for a period when students would have a relatively low work load in an effort to increase the likelihood of better response rates. However, owing to certain delays the survey was open for a period of twelve weeks between December 2012 and February 2013. This likely coincided with students' examination period and Christmas holidays, which may account for the low participation rate in this study. The conditions attached to recruitment from the Norwich Medical School state that only two reminder emails can be sent to students inviting participation in studies. Moreover, recruitment can only be considered from the investigator's own school. In this way there were considerable limitations upon recruiting in this manner, which likely had an impact upon the response rates in this study.

4.3.2.7 Responder bias. The potential for self-selection bias associated with recruiting to internet-based studies can be great (Fricker & Schonlau, 2002). However, several studies have compared the reliability and validity of web-based studies to identical studies carried out in the real world (Buchanan & Smith, 1999; Krantz, Ballard, & Scher, 1990). The results tentatively suggest that data are comparable for both methods in terms of the accuracy and response rates, and participants were also well matched in terms of demographic data. There may even be some evidence, when using open-ended questioning, that online surveys provided more candid responses. Other authors note the generalisability of results from web-based surveys to be low;

given the inherent restriction that responders must be computer literate and have internet access (Wyatt, 2000). However, in this study the student population all have equal access to the internet.

Given the format of the study those responders who did not complete any of the measures or demographic data were lost to analysis ($N = 32$). This group were considered to have left the study without giving reason - in line with their rights as per the information sheet (appendix A). As such it is impossible to make any firm conclusions about potential reasons for responder versus non-responder status. Of those participants who completed one measure or less, and entered their demographic information, there were only five participants. As such no conclusions can be drawn from such a low sample. However, the excluded cases had a lower mean age (22.28 years versus mean for total population of 26.11 years) and comprised 57.1% female and 42.8% male participants.

One advantage of the online study design was that aside from those who chose to leave the study after completing one measure or less, all other participants completed all the data sets. Participants were given automated reminders if they left out an item thus reducing the likelihood of missing data.

4.3.3 Measures.

4.3.3.1 Self-Compassion Scale (SCS; Neff, 2003). In order to aid comparison with previously published research data within the self-compassion literature, the SCS was chosen as the measure in this study. To date this is the only well-validated measure of the self-compassion construct and has been used extensively in published research (Neff, 2003; Neff & Vonk, 2009). However, its theoretical basis is grounded in the Buddhist understanding of self-compassion rather than being grounded within a psychological model. Gilbert (2005) differentially defines self-compassion within

social mentality theory, which arguably may have more relevance to the development and maintenance of psychopathology. Although attempts have been made at producing self-compassion measures based upon Gilbert's model (Gilbert & Irons, 2004; Mayhew & Gilbert, 2008), thus far alternatives to the SCS have not demonstrated adequate psychometric properties. As such the SCS still represents the best self-report measure of self-compassion to date.

4.3.3.2 Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason & Claridge, 2005). This measure of trait schizotypal symptoms was chosen given its relative benefits over other measures of trait schizotypy; in particular the length of time it takes to complete. However, it remains a time-consuming measure to administer given the 150 items it comprises. The O-LIFE has been extensively used in the literature owing to: its suitability for measuring normally distributed schizotypal symptomology within non-clinical populations, adequate psychometric properties (Mason & Claridge, 2006) and some utility in predicting transition rates to psychosis (Fenton & McGlashan, 1989). Indeed Steel et al. (2005) utilised the O-LIFE in studies substantiating their information processing account of the continuum of psychosis. Thus the use of the O-LIFE in this study aids comparison with such previous research and ensures validity of the construct being measured.

Other, more directly clinically relevant measures of schizotypy were evaluated in an earlier section. The Schizotypal Personality Questionnaire (SPQ; Raine, 1991) is noteworthy in this context. This is a measure based upon the diagnostic criteria for SPD. Like the O-LIFE, factor-analysis of the SPQ demonstrates a similar three-factor solution to psychosis (Bentall, et al., 1989). However, for the purpose of this research where a non-clinical population was utilised, the SPQ may have resulted in scores with even greater positive skew given its diagnostic utility. For these reasons it could be

argued that the O-LIFE was the appropriate measure of non-clinical schizotypal symptomology in this study.

4.3.3.3 Rosenberg Self-Esteem Scale (RSES, Rosenberg, 1965). This measure of global self-esteem was chosen for use in this study because it is well validated (Rosenberg, 1965) and extensively utilised within the literature (Schmitt & Allik, 2005). This aids comparison with other studies and allows for confidence in its psychometric properties. There remains a debate in the literature about the stability of the self-esteem construct over time (Savin-Williams & Demo, 1983). The reliability of self-report measures of self-esteem; such as the RSES, have also been questioned (Schmitt & Allik, 2005). This gives some indication of the difficulty associated with reliably tapping into the self-esteem construct. However, for the purposes of this exploratory study the RSES remains the most reliable and well-utilised measure of global self-esteem and as such the author concludes it was an appropriate measure for this particular research.

4.3.3.4 Other variables. The use of other measures within this research may have aided more robust conclusions regarding the data. Notable in this study, were the lack of assessment scales for depression, or distress associated with schizotypal symptomology.

4.3.3.4.1 Depression. The research outlined in chapter one suggested that distress associated with positive symptomatology influenced the development of positive psychotic symptoms in clinical populations (Garety et al., 2001). Further to this, self-compassionate models of the recovery from psychosis (Gumley et al., 2010; Read & Gumley, 2008) connect emotional dysregulation to the maintenance of unresolved negative features of psychosis. Co-morbid emotional dysregulation is also a key feature of the schizotypal presentation (Lewandowski et al., 2006). With this in

mind, and in the context of the robust association between self-compassion, self-esteem and psychopathology, the study would have benefited from including a measure of depression. Adding a measure of depression would have allowed the potential mediating effect of mood to be examined in further detail. For example in controlling for any variance associated with low mood when analysing the relationships amongst self-esteem, self-compassion and schizotypal scores. However, given the exploratory nature of the research, and the emphasis upon making the study attractive to a wide student population, the decision was made to keep the number of measures to a minimum. In particular, the O-LIFE measure has a large number of items and takes a relatively long time to complete, thus the addition of more measures in this study may have adversely affected the already low response rate. However, further research should consider examining the role of mood in the relationships between schizotypy, self-compassion and self-esteem.

4.3.3.4.2 Stigma. A measure of stigma associated with experience of schizotypal symptomatology may have also been a useful addition to the study design. Had a measure of stigma been utilised its effect could have been controlled for in the analyses, thus allowing for more firm conclusions about the non-clinical sample to be made. However, as previously asserted, the exploratory nature of the research and the expectation of low response rates meant that the number of measures used in the study was kept to a minimum.

4.4 Clinical Implications

By emphasising the relationships between self-esteem, self-compassion and schizotypal symptoms in a non-clinical sample this research has reduced the likelihood that the observed associations are solely an artefact of the psychosis disease process. Indeed it is the first study to demonstrate associations between the variables throughout

the continuum of psychosis. Previous research has demonstrated the efficacy of CFT (Braehler et al., 2012; Laithwaite et al., 2009; Mayhew & Gilbert, 2008) and mindfulness approaches (Chadwick et al., 2005) in the recovery from psychosis. However, the results of this study indicate that there is an association between self-compassion and its subscales (e.g. mindfulness) prior to the onset of psychosis, where a continuum approach to psychosis is endorsed. In doing so the current study provides some evidence that self-compassion and self-esteem may be worthwhile targets for future clinical research investigating the utility of self-compassionate and self-esteem interventions in 'at risk' populations.

The role of mindfulness, isolation, and negative self-judgements were all confirmed to have strong associations with schizotypal symptomatology. The strong association between positive schizotypal symptoms and mindfulness mirrors the findings in clinical populations; in which mindfulness approaches to treating positive symptomatology have demonstrated efficacy (Abba et al., 2008; Chadwick et al., 2005). Again where a continuum approach to psychosis is endorsed; there could be tentative support for clinicians to assess different aspects of individual's ability self-compassionately in UHR of psychosis populations. However, in respect of all the clinical implications outlined, it is likely too early to assume their validity. The results found in this study would need to be replicated in wider populations to ensure their generalisability; in particular a UHR population.

Another noteworthy clinical implication is that isolation was found to have a strong positive correlation with positive schizotypal symptoms. Previous research demonstrated that targeting social skills, and improving social closeness, was found to reduce scores on a measure of schizotypal symptomatology (Lieberman & Robertson, 2005). The result found in relation to hypothesis five therefore adds further support to

the role which social closeness may play in schizotypal symptomatology. It may be that group-based interventions targeting schizotypal symptomatology could provide a more naturalistic method of addressing the problems associated with social isolation in such presentations.

4.5 Future Research Directions

The results in this study warrant further investigation, particularly in seeking to replicate the novel findings, but also to further extrapolate the mechanisms proposed for explaining the nature of the relationships between the variables.

The cross-sectional design of the current study means that equally likely, but opposing mechanisms, could explain all the results. Future research should employ longitudinal or experimental designs in order to investigate how self-esteem and self-compassion relate to schizotypal experiences. Similarly, other variables not tested in this study (e.g. affect, social isolation, heightened threat monitoring and ToM) could also add theoretical legitimacy to the models outlined.

Another direction for research could be to investigate subscales analyses using other measures of the self-compassion construct. One criticism of the SCS is that it represents a less psychological-sound model of the self-compassion construct. Other measures based upon Gilbert's (2009) model of self-compassion are in their early development (Gilbert & Irons, 2004; Mayhew & Gilbert, 2008). However, such measures are less well-used in the literature and their validity has not been adequately tested. A comparison of the subscale analyses using these measures compared with the SCS may provide more clinically-relevant results. Future research, particularly where low responder rates are less of a constraint, should also aim to validate these more psychologically rigorous measures by utilising them alongside the SCS.

With respect to the mediating role of self-esteem; a measure of distress or mood should be included in studies aiming to replicate this finding. In particular, whether distress/ affect mediates the relationship between self-compassion and schizotypal symptomatology. There is already some clear support for this mechanism in clinical psychosis populations; whether this is mirrored in a schizotypal population is certainly of interest. In addition to this experience sampling methodologies could be utilised in order to investigate the impact of temporal fluctuations in self-esteem upon its mediating role.

The direct route by which self-compassion was found to relate to schizotypy is another area which warrants further examination. Here the similarities in underlying cognitive and emotional dysfunction could be investigated to determine whether the tentative mechanism proposed by the author stands up to scrutiny.

The moderating effect of self-compassion upon the relationship between self-esteem and schizotypal symptomatology was not determined in this study. However, it may be the case that specific factors relating to issues of multicollinearity had an impact upon this non-significant result. The issue of multicollinearity increases the likelihood of Type II error i.e. incorrectly accepting the null hypothesis. Given the sound theoretical underpinnings of this hypothesis it would be useful to repeat this analysis in order to determine whether the non-significant result is replicated. In order to address the issue of multicollinearity, more detailed factor analyses of the convergent and divergent validity of the self-esteem and self-compassion constructs may be necessary. This would enable variables which clearly violated multicollinearity to be removed before re-analysing the data. The unique contribution to a regression model of self-compassion and self-esteem on schizotypal scores could then be investigated.

Finally given that exposure to trauma has been posited as a potential aetiological factor in the development of schizotypy and low self-compassion, it may also be worthwhile screening future participants for exposure to childhood trauma.

4.6 Summary

The current methodology was exploratory and utilised a non-clinical population to represent the continuum of psychotic experiences using the schizotypy construct. In doing so the author sought to investigate whether relationships; demonstrated in clinical populations, were also observable prior to the onset of psychosis. In this way, the study design removed some of the confounding variables which are related to the disease process itself. Within this context the study aimed to provide useful information about specific targets for future research.

The finding that reduced self-compassion and low self-esteem were associated with increased schizotypal symptoms in a non-clinical population was suggestive of both self-compassion and self-esteem having a role in schizotypal symptomatology. The cross-sectional nature of the study design did not allow for conclusions to be made regarding causation. As such, it was assumed equally likely that both self-esteem and self-compassion could be a vulnerability factor in the development of schizotypy, or increasing schizotypal symptomatology could have eroded participant's ability to act self-compassionately and lowered their self-esteem. However, the posited stability of self-compassion over time (Neff, 2007) with its development in early attachment behaviour makes the vulnerability hypothesis more theoretically attractive.

In addition, the results supported a mediation mechanism by which self-compassion and schizotypy were related via self-esteem. This is the first research to demonstrate a relationship between the three variables and propose a mechanism by which they could be related i.e. partial mediation. Finally, the results of the current

study go some way in identifying that all aspects of self-compassion, as measured using the SCS, may be important factors to consider in the relationship between self-compassion and schizotypal symptomatology. Within a continuum approach to psychosis, the research may have some tentatively proposed clinical implications; although in line with the original aim of the study, there are more theoretical and research implications from this research.

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Appendices

Appendix A

The Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE; Mason & Claridge, 1995)

Please Read the Instructions Before Continuing:

This questionnaire contains questions that may relate to your thoughts, feelings, experiences and preferences. There are no right or wrong answers or trick questions so please be as honest as possible. For each question place a circle around either the "YES" or the "NO". Do not spend too much time deliberating any question but put the answer closest to your own.

Please do not discuss the questionnaire with anyone who may also complete it as this may affect their answers. It is best completed in private, without the need to hurry.

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|----|--------------------------------------------------------------------------------------------------------------------|-----|----|
| 1 | Do you prefer reading to meeting people? | YES | NO |
| 2 | Do you often hesitate when you are going to say something in a group of people whom you more or less know? | YES | NO |
| 3 | Are you always willing to admit it when you have made a mistake? | YES | NO |
| 4 | Do you hate being alone? | YES | NO |
| 5 | Do you often overindulge in alcohol or food? | YES | NO |
| 6 | Do you often feel that people have it in for you? | YES | NO |
| 7 | Are the sounds you hear in your daydreams really clear and distinct? | YES | NO |
| 8 | Do you enjoy many different kinds of play and recreation? | YES | NO |
| 9 | Do your thoughts sometimes seem as real as actual events in your life? | YES | NO |
| 10 | Does it often happen that nearly every thought immediately and automatically suggests an enormous number of ideas? | YES | NO |
| 11 | When in a group of people do you usually prefer to let someone else be the centre of attention? | YES | NO |
| 12 | If you say you will do something do you always keep your promise no matter how inconvenient it might be? | YES | NO |
| 13 | Do you frequently have difficulty in starting to do things? | YES | NO |
| 14 | Has dancing or the idea of it always seemed dull to you? | YES | NO |
| 15 | When you catch a train do you often arrive at the last minute? | YES | NO |
| 16 | Is trying new foods something you have always enjoyed? | YES | NO |
| 17 | Do you always wash before a meal? | YES | NO |
| 18 | Do you believe in telepathy? | YES | NO |
| 19 | Do you often change between intense liking and disliking of the same person? | YES | NO |

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|----|-------------------------------------------------------------------------------------------------------------------------|-----|----|
| 20 | Have you ever cheated at a game? | YES | NO |
| 21 | Are there very few things that you have ever really enjoyed doing? | YES | NO |
| 22 | Do you at times have fits of laughing or crying that you can't control? | YES | NO |
| 23 | Do you at times have an urge to do something harmful or shocking? | YES | NO |
| 24 | Do you often worry about things you should not have done or said? | YES | NO |
| 25 | Are your thoughts sometimes so strong that you can almost hear them? | YES | NO |
| 26 | Do you usually take the initiative in making new friends? | YES | NO |
| 27 | Do your thoughts ever stop suddenly causing you to interrupt what you are saying? | YES | NO |
| 28 | Are you usually in an average sort of mood, not too high and not too low? | YES | NO |
| 29 | Would you take drugs which may have strange or dangerous effects? | YES | NO |
| 30 | Do you think you could learn to read other's minds if you wanted to? | YES | NO |
| 31 | When in a crowded room, do you often have difficulty in following a conversation? | YES | NO |
| 32 | No matter how hard you try to concentrate do unrelated thoughts always creep into your mind? | YES | NO |
| 33 | Are you easily hurt when people find fault with you or the work you do? | YES | NO |
| 34 | Do you stop to think things over before doing anything? | YES | NO |
| 35 | Have you ever felt that you have special, almost magical powers? | YES | NO |
| 36 | Are you much too independent to really get involved with other people? | YES | NO |
| 37 | Do you ever get nervous when someone is walking behind you? | YES | NO |
| 38 | Do ideas and insights sometimes come to you so fast that you cannot express them all? | YES | NO |
| 39 | Do you easily lose your courage when criticised or failing in something? | YES | NO |
| 40 | Can some people make you aware of them just by thinking about you? | YES | NO |
| 41 | Does a passing thought ever seem so real it frightens you? | YES | NO |
| 42 | Do you always practice what you preach? | YES | NO |
| 43 | Do you often have periods of such great restlessness that you aren't able to sit still for more than a very short time? | YES | NO |
| 44 | Have you ever blamed someone for doing something you know was really your fault? | YES | NO |
| 45 | Are you a person whose mood goes up and down easily? | YES | NO |
| 46 | Does your voice ever seem distant or faraway? | YES | NO |
| 47 | Do you think having close friends is not as important as some people say? | YES | NO |
| 48 | Do you like doing things in which you have to act quickly? | YES | NO |
| 49 | Are you rather lively? | YES | NO |

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|----|------------------------------------------------------------------------------------------------------------------|-----|----|
| 50 | Do you feel at times that people are talking about you? | YES | NO |
| 51 | Are you sometimes so nervous that you are “blocked”? | YES | NO |
| 52 | Do you find it difficult to keep interested in the same thing for a long time? | YES | NO |
| 53 | Do you dread going into a room by yourself where other people have already gathered and are talking? | YES | NO |
| 54 | Have you ever felt that you were communicating with someone telepathically? | YES | NO |
| 55 | Does it often feel good to massage your muscles when they are tired or sore? | YES | NO |
| 56 | Do you sometimes feel that your accidents are caused by mysterious forces? | YES | NO |
| 57 | Do you like mixing with people? | YES | NO |
| 58 | On seeing a soft thick carpet have you sometimes had the impulse to take off your shoes and walk barefoot on it? | YES | NO |
| 59 | Do you frequently gamble money? | YES | NO |
| 60 | Do you often have difficulties in controlling your thoughts? | YES | NO |
| 61 | Do you feel that you cannot get “close” to other people? | YES | NO |
| 62 | Do the people in your daydreams seem so true to life that you sometimes think they are real? | YES | NO |
| 63 | Do other people think of you as being very lively? | YES | NO |
| 64 | Are people usually better off if they stay aloof from emotional involvements with people? | YES | NO |
| 65 | Does life seem entirely hopeless? | YES | NO |
| 66 | Can just being with friends make you feel really good? | YES | NO |
| 67 | Do you enjoy meeting new people? | YES | NO |
| 68 | Is your hearing sometimes so sensitive that ordinary sounds become uncomfortable? | YES | NO |
| 69 | Have you often felt uncomfortable when your friends touch you? | YES | NO |
| 70 | When things are bothering you do you like to talk to other people about it? | YES | NO |
| 71 | Do you ever have the sensation that your body or a part of it is changing shape? | YES | NO |
| 72 | Do you have many friends? | YES | NO |
| 73 | Are all your habits good and desirable ones? | YES | NO |
| 74 | Do you tend to keep in the background on social occasions? | YES | NO |
| 75 | Would being in debt worry you? | YES | NO |
| 76 | Have you ever felt when you looked in a mirror that your face seemed different? | YES | NO |
| 77 | Do you think people spend too much time safeguarding their future with savings and insurance? | YES | NO |
| 78 | Do you believe that dreams can come true? | YES | NO |
| 79 | Do you ever have the urge to break or smash things? | YES | NO |
| 80 | Do you often feel that there is no purpose to life? | YES | NO |

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|-----|--------------------------------------------------------------------------------------------------------------------------|-----|----|
| 81 | Do things sometimes feel as though they were not real? | YES | NO |
| 82 | Do you worry about awful things that might happen? | YES | NO |
| 83 | Have you ever felt the urge to injure yourself? | YES | NO |
| 84 | Would it make you nervous to play the clown in front of other people? | YES | NO |
| 85 | Do you prefer watching television to going out with other people? | YES | NO |
| 86 | Have you felt that you might cause something to happen just by thinking too much about it? | YES | NO |
| 87 | Have you had very little fun from physical activities like walking, swimming or sports? | YES | NO |
| 88 | Do you ever have suicidal thoughts? | YES | NO |
| 89 | Have you ever said anything bad or nasty about anyone? | YES | NO |
| 90 | Do you feel so good at controlling others that it sometimes scares you? | YES | NO |
| 91 | Are you easily distracted from work by daydreams? | YES | NO |
| 92 | Are you easily confused if too much happens at the same time? | YES | NO |
| 93 | Do you ever have a sense of vague danger or sudden dread for reasons that you do not understand? | YES | NO |
| 94 | Is it true that your relationships with other people never get very intense? | YES | NO |
| 95 | Do you feel that you have to be on your guard even with your friends? | YES | NO |
| 96 | Have you sometimes had the feeling of gaining or losing energy when certain people look at you or touch you? | YES | NO |
| 97 | When coming into a new situation have you ever felt strongly that it was a repeat of something that had happened before? | YES | NO |
| 98 | Do you worry too long after an embarrassing experience? | YES | NO |
| 99 | Do you love having your back massaged? | YES | NO |
| 100 | Do you consider yourself to be pretty much an average kind of person? | YES | NO |
| 101 | Have you ever taken advantage of someone? | YES | NO |
| 102 | Would you like other people to be afraid of you? | YES | NO |
| 103 | Have you ever thought you heard people talking only to discover that it was in fact some nondescript noise? | YES | NO |
| 104 | Have you occasionally felt as though your body did not exist? | YES | NO |
| 105 | Do you often feel lonely? | YES | NO |
| 106 | Do you often have an urge to hit someone? | YES | NO |
| 107 | Do you often experience an overwhelming sense of emptiness? | YES | NO |
| 108 | On occasions, have you seen a person's face in front of you when no one was in fact there? | YES | NO |
| 109 | Do you feel it is safer to trust nobody? | YES | NO |
| 110 | Is it fun to sing with other people? | YES | NO |

- | | | | |
|-----|-----------------------------------------------------------------------------------------------------------------------|-----|----|
| 111 | Do you often have days when indoor lights seem so bright that they bother your eyes? | YES | NO |
| 112 | Have you wondered whether the spirits of the dead can influence the living? | YES | NO |
| 113 | Do people who try to get to know you better usually give up after a while? | YES | NO |
| 114 | Do you often feel “fed up”? | YES | NO |
| 115 | Have you felt as though your head or limbs were somehow not your own? | YES | NO |
| 116 | Do you ever become oversensitive to light or noise? | YES | NO |
| 117 | When you look in the mirror does your face sometimes seem quite different from usual? | YES | NO |
| 118 | Do people who drive carefully annoy you? | YES | NO |
| 119 | Do you like telling jokes and funny stories to your friends? | YES | NO |
| 120 | Are your thoughts about sex often odd or bizarre? | YES | NO |
| 121 | Are you very hurt by criticism? | YES | NO |
| 122 | Do you feel lonely most of the time, even when you’re with people? | YES | NO |
| 123 | Would you call yourself a nervous person? | YES | NO |
| 124 | Can you usually let yourself go and enjoy yourself at a lively party? | YES | NO |
| 125 | Do you ever feel that your thoughts don’t belong to you? | YES | NO |
| 126 | Do you ever suddenly feel distracted by distant sounds that you are not normally aware of? | YES | NO |
| 127 | As a child, did you do as you were told immediately and without grumbling? | YES | NO |
| 128 | Do you sometimes talk about things you know nothing about? | YES | NO |
| 129 | When you are worried or anxious do you have trouble with your bowels? | YES | NO |
| 130 | When in the dark do you often see shapes and forms even though there’s nothing there? | YES | NO |
| 131 | Do you often have vivid dreams that disturb your sleep? | YES | NO |
| 132 | Do you like plenty of bustle and excitement around you? | YES | NO |
| 133 | Have you sometimes sensed an evil presence around you, even though you could not see it? | YES | NO |
| 134 | Is it hard for you to make decisions? | YES | NO |
| 135 | Do you find the bright lights of a city exciting to look at? | YES | NO |
| 136 | Does your sense of smell sometimes become unusually strong? | YES | NO |
| 137 | Do you usually have very little desire to buy new kinds of food? | YES | NO |
| 138 | Are you often bothered by the feeling that people are watching you? | YES | NO |
| 139 | Do you ever feel that your speech is difficult to understand because the words are all mixed up and don’t make sense? | YES | NO |

- 140 Do you often feel like doing the opposite of what people suggest, even though you know they are right? YES NO
- 141 Do you like going out a lot? YES NO
- 142 Do you feel very close to your friends? YES NO
- 143 Are you sometimes sure that other people can tell what you're thinking? YES NO
- 144 Do you ever feel sure that something is about to happen, even though there does not seem to be any reason for you thinking that? YES NO
- 145 Do you often feel the impulse to spend money which you know you can't afford? YES NO
- 146 Are you easily distracted when you read or talk to someone? YES NO
- 147 Are you a talkative person? YES NO
- 148 Do everyday things sometimes seem unusually large or small? YES NO
- 149 Do you feel that making new friends isn't worth the energy it takes? YES NO
- 150 Have you ever taken the praise for something you knew someone else had really done? YES NO

Appendix B

The Self-compassion-Scale (Neff, 2003)

HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

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

- | Almost
never | | | | | Almost
always | |
|-------------------------|----------|----------|----------|----------|--------------------------|-----------------------------------------------------------------------------------------------------------------------|
| 1 | 2 | 3 | 4 | 5 | | |
| _____ | | | | | | 1. I'm disapproving and judgmental about my own flaws and inadequacies. |
| _____ | | | | | | 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong. |
| _____ | | | | | | 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through. |
| _____ | | | | | | 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world. |
| _____ | | | | | | 5. I try to be loving towards myself when I'm feeling emotional pain. |
| _____ | | | | | | 6. When I fail at something important to me I become consumed by feelings of inadequacy. |
| _____ | | | | | | 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am. |
| _____ | | | | | | 8. When times are really difficult, I tend to be tough on myself. |
| _____ | | | | | | 9. When something upsets me I try to keep my emotions in balance. |
| _____ | | | | | | 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 intolerant and impatient towards those aspects of my personality I don't like. |
| _____ | | | | | | 12. When I'm going through a very hard time, I give myself the caring and tenderness I need. |
| _____ | | | | | | 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am. |
| _____ | | | | | | 14. When something painful happens I try to take a balanced view of the |

situation.

- _____ 15. I try to see my failings as part of the human condition.
- _____ 16. When I see aspects of myself that I don't like, I get down on myself.
- _____ 17. When I fail at something important to me I try to keep things in perspective.
- _____ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
- _____ 19. I'm kind to myself when I'm experiencing suffering.
- _____ 20. When something upsets me I get carried away with my feelings.
- _____ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
- _____ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
- _____ 23. I'm tolerant of my own flaws and inadequacies.
- _____ 24. When something painful happens I tend to blow the incident out of proportion.
- _____ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
- _____ 26. I try to be understanding and patient towards those aspects of my personality I don't like.

Appendix C

Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965)

Rosenberg Self-Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle **SA**. If you agree with the statement, circle **A**. If you disagree, circle **D**. If you strongly disagree, circle **SD**.

1.	On the whole, I am satisfied with myself.	SA	A	D	SD
2.*	At times, I think I am no good at all.	SA	A	D	SD
3.	I feel that I have a number of good qualities.	SA	A	D	SD
4.	I am able to do things as well as most other people.	SA	A	D	SD
5.*	I feel I do not have much to be proud of.	SA	A	D	SD
6.*	I certainly feel useless at times.	SA	A	D	SD
7.	I feel that I'm a person of worth, at least on an equal plane with others.	SA	A	D	SD
8.*	I wish I could have more respect for myself.	SA	A	D	SD
9.*	All in all, I am inclined to feel that I am a failure.	SA	A	D	SD
10.	I take a positive attitude toward myself.	SA	A	D	SD

Scoring: SA=3, A=2, D=1, SD=0. Items with an asterisk are reverse scored, that is, SA=0, A=1, D=2, SD=3. Sum the scores for the 10 items. The higher the score, the higher the self esteem.

The scale may be used without explicit permission. The author's family, however, would like to be kept informed of its use:

The Morris Rosenberg Foundation
 c/o Department of Sociology
 University of Maryland
 2112 Art/Soc Building
 College Park, MD 20742-1315

Appendix D

Letter confirming ethical approval

Faculty of Medicine and Health Sciences Research Ethics Committee



Nicola Marshall
Doctoral Programme in Clinical Psychology,
Elizabeth Fry Building 2.30
Norwich Medical School
University of East Anglia
Norwich
NR4 7UJ

Research & Enterprise Services
West Office (Science Building)
University of East Anglia
Norwich Research Park
Norwich, NR4 7TJ

Telephone: +44 (0) 1620 891574
Fax: 01620 891080
Email: res.ethics@uea.ac.uk

Web: www.uea.ac.uk/research/academicoffice

12 October 2012

Dear Nicola

Title: Schizotypy and Self-compassion
Reference: 2011/2012-04

The amendments to your above proposal have been considered by the Chair of the Faculty Research Ethics Committee and we can confirm that your proposal has been approved.

Please could you ensure that any further amendments to either the protocol or documents submitted are notified to us in advance and also that any adverse events which occur during your project are reported to the Committee. Please could you also arrange to send us a report once your project is completed.

The Committee would like to wish you good luck with your project.

Yours sincerely

A handwritten signature in blue ink that reads 'Yvonne Kirkham'.

Yvonne Kirkham
Project Officer

Appendix E

Contact information

Thank you for taking our survey.

It is unlikely that you will feel any adverse effects from taking part in this study. However, if you feel you have been adversely affected by answering any of the questions in this survey there are a number of places you can contact for information, help or support.

The University of East Anglia offers a confidential student support service called **Nightline**. The service is open during term time from **8pm-8am** every day. They can be contacted on **01603 503504**. You can also use Nightline on Skype. Search '**ueanightline**', then video call, voice call or text chat, completely free.

The Samaritans offer **24 hour, 7 days a week** telephone support to those who may be feeling suicidal. They can be contacted confidentially on **08457 909090**.

Your **General practitioner (GP)** will also be able to offer you support and advice about any mental health problems. You can also contact **NHS Direct** on **0845 46 47** for advice about where to get support.

The **Hearing Voices Network** is a national network of people affected by hearing voices (auditory hallucinations). They can be contacted on **0114 271 8210** or by email **nhvn@hotmail.co.uk** during office hours (9am-5pm).

We advise that you print and keep this page in case you may need to use the contact numbers provided.

Appendix F



Participant Information Sheet

Investigating personality, life events and self-compassion

Researchers: Nicola Marshall, Professor Malcolm Adams, & Dr Sian Coker

We would like to invite you to take part in a research study. Before you decide you need to understand why the research is being done and what it will involve for you. Please take time to read the following information carefully. Talk to others about the study if you wish. Ask us if there is anything that is not clear or if you would like more information. Take time to decide whether or not you wish to take part.

What is the purpose of the study?

The focus of the research is on what relationships may occur between life events, personality traits and self-compassion. We are interested in whether life events and self-compassion contribute to our understanding of how specific personality traits such as sociability develop. The study is being carried out by a trainee clinical psychologist as part of their course.

Do I have to take part?

No. It is up to you to decide whether or not to take part. If you do, your consent will be assumed if you click continue and complete the questionnaires on-line. You are still free to withdraw at any time and without giving a reason. If you decide to withdraw at any time this will not adversely affect your employment or enrolment at the University of East Anglia. Although once you have submitted the final questionnaire we will be unable to withdraw your data as it will no longer be identifiable. We will not keep any identifiable information about you with your data.

What will happen to me if I take part?

If you agree to take part in the study you will be asked to complete three questionnaires. It is likely that the questionnaires will take around 30 minutes to complete. There are a total of 196 questions. After completing all the questionnaires you will be asked whether you would like to be entered into a prize draw to win £50 Amazon voucher. If you do, you will need to fill out your email address in the relevant box as a contact. This box (and hence your email address) is not linked to the questionnaire answers.

What are the possible disadvantages and risks of taking part?

Because the questionnaires contain items asking you about various life events that you may have experienced, there is a small possibility that you may find reading them upsetting. At any point you may if you wish, stop completing the questionnaire and the

researcher has provided a list of useful contacts at the end of this sheet. What are the possible benefits of taking part? It is hoped that by having a better understanding of the relationships between self-compassion, self-esteem and personality we can understand common mental health problems more fully.

What if there is a problem? What if I want to make a complaint?

Should you feel you have been treated unfairly or have come to harm as a result of taking part in this study you should contact the researcher's supervisor using the contact details provided.

Professor Malcolm Adams
Doctoral Programme in Clinical Psychology
Norwich Medical School
University of East Anglia
Norwich NR4 7TJ
Tel: 01603 593600
Email: m.adams@uea.ac.uk

Will my taking part in this study be kept confidential?

Yes. We will follow ethical and legal practice and all information about you will be handled in confidence. The only identifiable material kept will be your email address if you wish to be considered for the prize draw. Contact details will be destroyed as soon as the draw has been made.

What will happen to the results of the research study?

The information collected will be written into final reports for examination purposes within the researcher's Doctorate in Clinical Psychology programme. The anonymised data will be kept electronically by the University of East Anglia for five years. The data will be stored in compliance with the principles of the Data Protection Act. The results may also be published in a relevant journal. You will not be identified in any of these reports or data stores.

Who is organising and funding the research?

The research is being funded by the University of East Anglia as part of a student project.

Who has reviewed the study?

This study has been reviewed and approved by The University of East Anglia's Faculty of Health Research Ethics Committee.

Thank you for taking time to read this sheet. We advise that this information sheet can be printed off separately and kept.

Appendix G**Formula to calculate Holm's sequential Bonferroni calculation**

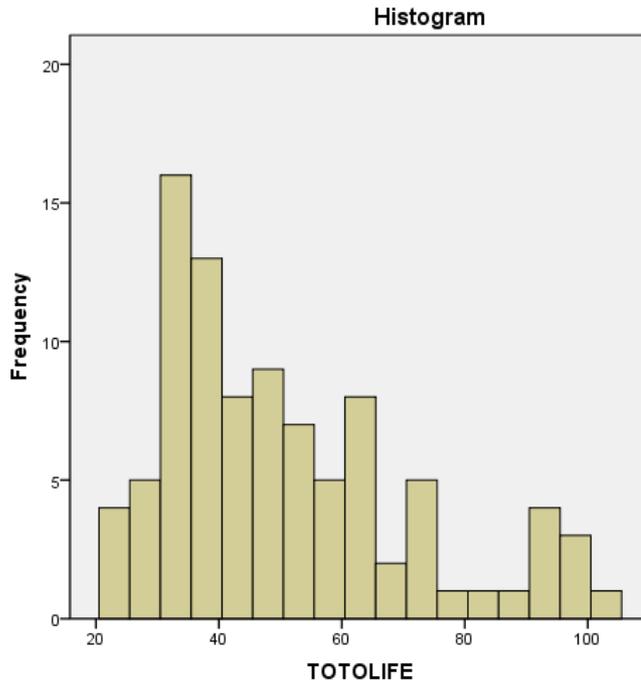
$$\frac{\text{Target p value}^*}{n - \text{rank number of the pair in terms of degree of significance} + 1}$$

*In which the target p-value was .05

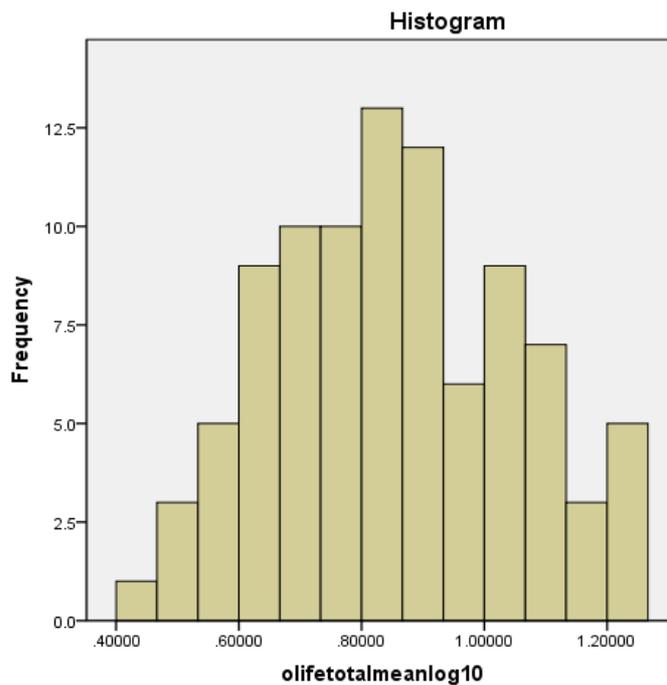
Appendix H

Histograms to illustrate O-LIFE scores before and after log10 transformation

Distribution of total O-LIFE scores before log10 transformation, indicating non-normal distribution

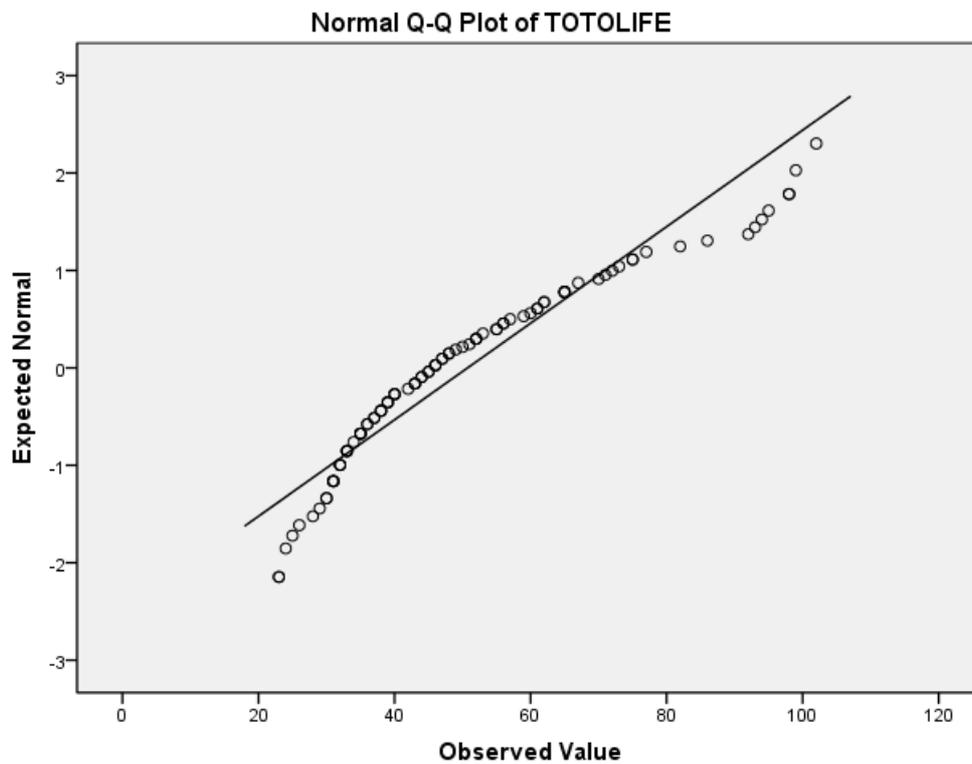


Distribution of total O-LIFE scores after log10 transformation, indicating normal distribution was achieved.

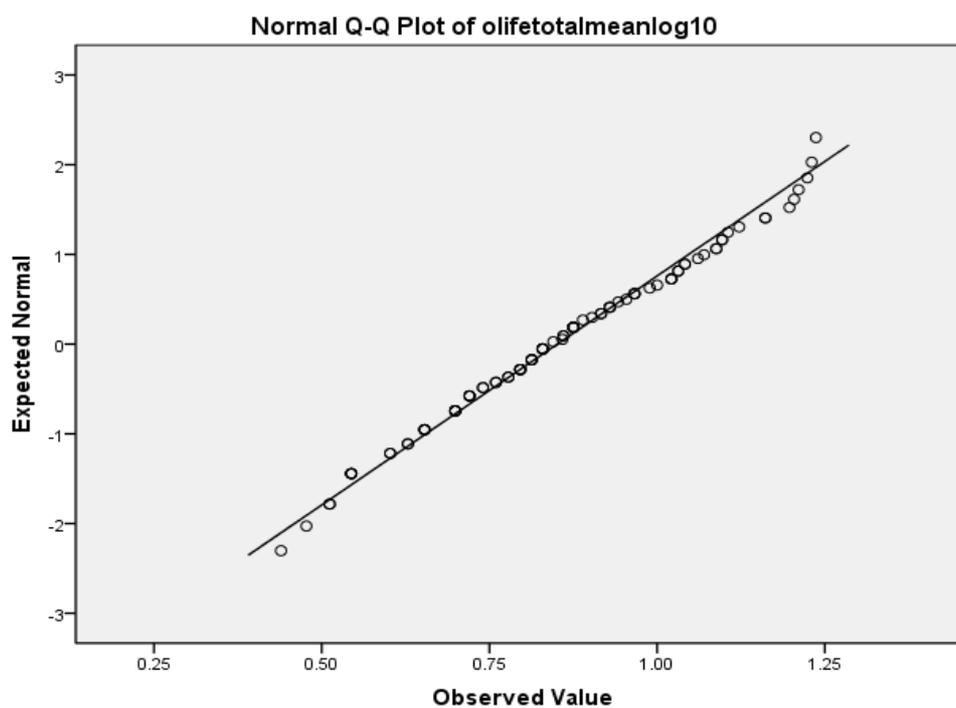


Appendix I**Q-Q normal plots of O-LIFE scores before and after log10 transformation.**

Normal Q-Q plot of total O-LIFE scores before log10 transformation

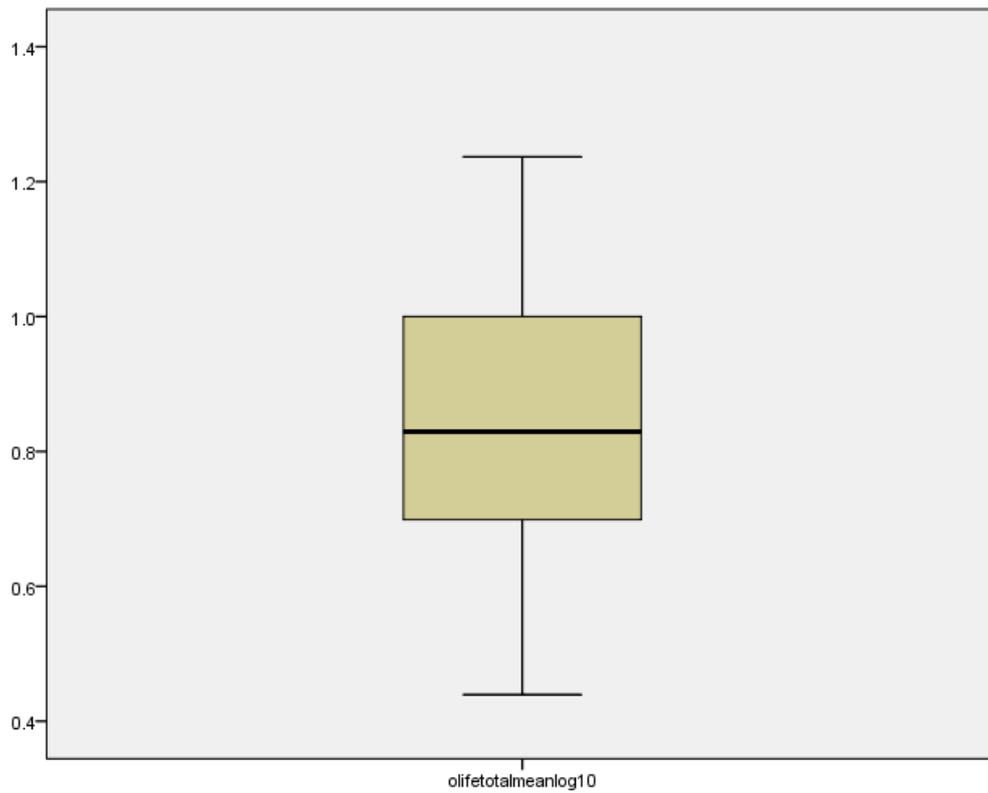


Normal Q-Q plot of total O-LIFE scores after log10 transformation



Appendix J

Box Plot for log10 transformed O-LIFE scores



Appendix K**Collinearity diagnostics demonstrating variance proportions were unevenly loaded across eigenvalues**

Collinearity Diagnostics ^a						
Model	Dimension	Eigenvalue	Condition Index	Variance Proportions		
				(Constant)	sestotalmeanlog10	scstotalmeanlog10
1	1	2.989	1.000	.00	.00	.00
	2	.008	19.217	.65	.34	.01
	3	.003	34.369	.35	.66	.99

a. Dependent Variable: olifetotalmeanlog10

Appendix L**Post-Hoc Analyses: After Stratifying for Gender**

	O-LIFE	SCS
SES	-.660**	.768**
SCS		-.596**

Table 5: Pearson's correlation matrix for self-compassion, self-esteem and schizotypy in male participants (N = 25)

Notes: Self-Compassion Scale (SCS), log10 transformed Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE), Rosenberg Self-Esteem Scale (SES). **=highly significant correlation at the $p < .001$ level, * =significant correlation at the $p < .005$ level.

Appendix M**Post-Hoc Analyses: After Stratifying for Gender**

	O-LIFE	SCS
SES	-.705**	.807**
SCS	-.701**	

Table 6: Pearson's correlation matrix for self-compassion, self-esteem and schizotypy in female participants (N = 68)

Notes: Self-Compassion Scale (SCS), log10 transformed Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE), Rosenberg Self-Esteem Scale (SES).

**=highly significant correlation at the $p < .001$ level, * =significant correlation at the $p < .005$ level.

Appendix N**Post-Hoc Analyses: After Stratifying for Age**

	O-LIFE	SCS
SES	-.728**	.860**
SCS	-.692**	

Table 7: Pearson's correlation matrix for self-compassion, self-esteem and schizotypy in under 25 year olds (N = 54).

Notes: Self-Compassion Scale (SCS), log10 transformed Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE), Rosenberg Self-Esteem Scale (SES). **=highly significant correlation at the $p < .001$ level, * =significant correlation at the $p < .005$ level.

Appendix O**Post-Hoc Analyses: After Stratifying for Age**

	O-LIFE	SCS
SES	-.602**	.686**
SCS	-.705**	

Table 8: Pearson's correlation matrix for self-compassion, self-esteem and schizotypy in over 26 year olds (N = 39).

Notes: Self-Compassion Scale (SCS), log10 transformed Oxford-Liverpool Inventory of Feelings and Experiences (O-LIFE), Rosenberg Self-Esteem Scale (SES).

**=highly significant correlation at the $p < .001$ level, * =significant correlation at the $p < .005$ level.