Nonclinical Paranoia and Values in the Prisoner's Dilemma Game

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ABSTRACT

Paranoia is increasingly considered to be a common phenomenon in the general population and is not just a symptom of diagnosable psychiatric disorders. Recently, Ellett, Allen-Crooks, Stevens, Wildschut & Chadwick (2013) argued that distrust-based competition in the Prisoners Dilemma Game (PDG) is a novel behavioural marker for nonclinical paranoia. The present study sought to replicate the finding of Ellett et al. (2013) and to extend their research by looking to the social psychology literature on human values as additional potential motivations for competition in the PDG. Additionally, the study sought to examine relationships between paranoia in the nonclinical population and human values, and offer support for a recently refined theory of human values (Schwartz et al., 2012).

Consistent with prediction, higher trait paranoia was associated with valuing face, that is, holding a commitment to security and power through maintaining one's public image and avoiding humiliation, and lower trait paranoia was associated with valuing universalism-tolerance, that is, showing acceptance and understanding for others. Secondly, and consistent with prediction, the current findings replicated that of Ellett et al. (2013) to show that distrust-based PDG competition is a behavioural marker for nonclinical paranoia. Thirdly, the present research offered a secondary behavioural marker for nonclinical paranoia based on a commitment to valuing power. Lastly, the study offered support for the circular structure of values in Schwartz's (2012) refined theory.

Collectively, the current findings provided further evidence for the role of the PDG in the measurement and investigation of nonclinical paranoia, and more

specifically provided a foundation for further research into the role that values could

play in furthering this understanding.

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INTRODUCTION

1.1 Overview of Introduction Chapter

Researchers over the last 15 years have begun to free paranoia from its association with severe mental illness and it is now viewed as a phenomenon to be explained in its own right (Freeman, 2007). Indeed, an increasingly large evidence base shows that persecutory delusions exist in individuals who do not meet diagnostic criteria for psychosis and are viewed as a form of belief that exists on a continuum of normal human experience (Strauss, 1969). Additionally, the continuum approach also offers a crucial opportunity for the theoretically justified study of paranoia in nonclinical populations to inform the understanding of clinical paranoia (e.g., Bebbington et al., 2013; Combs & Penn, 2004; David, 2010; Freeman, Garety, Bebbington, Smith et al., 2005).

In contrast to the literatures' reliance on self-report measures, recently, an experimental paradigm, the Prisoners Dilemma (PDG) has been shown to provide the first behavioural measure of nonclinical paranoia (Ellett, Allen-Crooks, Stevens, Wildschut & Chadwick, 2013). Specifically, distrust-based competition was associated with nonclinical paranoia, and the authors concluded by considering the potential role of other motivations for competition on the PDG to be additional novel markers for nonclinical paranoia. Given the role of values as determinates of behaviour (Rokeach, 1973; Schwartz, 1992) this body of literature is explored and offered as a lucrative framework for further exploration into the use of the PDG in nonclinical paranoia.

Based on this empirical and theoretical work, the current thesis aimed to replicate and extend research into nonclinical paranoia and values. Firstly, the thesis

aimed to explore human values in relation to nonclinical paranoia to provide evidence for the explanatory power of values in relation to behaviour and extend the knowledge base on Schwartz et al. (2012)'s refined theory of human values. Secondly, the thesis aimed to replicate the finding of Ellett et al. (2013) that distrust-based competition on the PDG is a behavioural marker for nonclinical paranoia to provide additional empirical support for the use of the PDG in this research area. The third aim of the current research was to extend the research of Ellett et al. (2013) and broaden our understanding of paranoia in the nonclinical population with reference to the social psychology literature on human values as potential motivations for competition on the PDG. Lastly, the fourth aim was to combine the three areas of research of nonclinical paranoia, the PDG and human values theory to establish whether more complex interactions between paranoia and values were associated with PDG competition.

This chapter begins by introducing the categorical and continuous approaches to understanding psychosis with a particular focus on theories and models which support that paranoia exists on a continuum of normal experience (e.g., Chapman & Chapman, 1980; Claridge, 1997; Strauss, 1969). In line with dimensional views of paranoia (e.g., Garety & Hemsley, 1994), a definition of persecutory delusions as used in the current research is then discussed (Freeman & Garety, 2000). This is followed by a review of the literature regarding the prevalence of paranoia in the nonclinical population including survey, longitudinal and experimental methodologies. This concludes with a discussion relating to the novel behavioral marker of nonclinical paranoia of distrust-based competition on the PDG (Ellett et al., 2013). The chapter then introduces the human values literature and presents Schwartz et al.'s (2012) model of human values. The chapter will conclude by providing a rationale for combining the

three literatures on the PDG, values and nonclinical paranoia to inform the hypotheses for the current thesis.

1.2 Categorical vs Continuous Approaches to Psychosis and Psychotic Symptoms

The traditional medical model assumes a categorical view of psychotic symptoms such as paranoid delusions in which differences between psychotic symptoms and their normal counterparts are considered to be qualitative (Johns & van Os, 2001). Paranoid delusions have historically been considered to be discreet and discontinuous and therefore were not deemed to be a part of normal healthy psychological functioning (Tai & Turkington, 2009). Historically, this clinical perspective has greatly influenced the conceptualisation of psychiatric disorders, with traditional classification systems determining the presence (or absence) of mental disorders such as psychosis based on whether individuals do (or do not) present with symptoms (John & van Os, 2001). However, as early as the late 1960s, Strauss (1969) first challenged the concept that paranoid delusions were categorical. As Spitzer (1992) summarizes later, "there is more to say about delusions than that they are present or absent" (Freeman & Garety, 2000, p.413).

It is now widely asserted that delusions are not discrete, discontinuous entities but instead should be considered as complex, multidimensional phenomena (Garety & Hemsley, 1994). Freeman and Garety (2006) endorse the position of Oltmanns (1988) who suggests the presence of a delusion is best accomplished by considering a list of characteristics or dimensions, none of which alone is necessary or sufficient but that with increasing endorsement produces greater agreement on the presence of a delusion.

Phenomenological studies show that delusional beliefs, like ordinary beliefs and attitudes, vary across a number of dimensions such as their bizarreness, the conviction with which they are held, the extent to which the person is preoccupied by them, and the extent to which they lead to distress (Garety, Everitt & Hemsley, 1988; Garety & Hemsley, 1987; Kendler, Glazer, & Morgenstern, 1983). Indeed, modern classification systems, namely the DSM-V (American Psychological Association, 2013) are reflecting this shift by acknowledging that the signs and symptoms of psychosis are on a continuum with normal mental states (Allardyce, Suppes & van Os, 2007). Although this most recent version of the DSM does not go so far as to replace the categorical diagnosis of psychiatric disorders, it does attempt to capture this underlying dimensional structure of psychotic symptomology within the constraints of a categorical system (Heckers et al., 2013).

1.2.1 The Continuum Hypothesis

The dimensional approach to delusions implies that they might be found, perhaps in a less severe form, in people who have not sought or received psychiatric treatment (Bentall, Corcoran, Howard, Blackwood, & Kinderman, 2001). Current thinking, drawing on a large body of support from phenomenological studies, epidemiology, developmental psychopathology, and cognitive psychology (e.g., Freeman, Garety, Bebbington, Smith et al., 2005; Johns et al., 2004; Kaymaz & van Os, 2010; Linscott & van Os, 2010; van Os & Verdoux, 2003) suggests that paranoid delusions, although characteristic of psychotic phenomena, may be far more accurately understood as being widespread in nonclinical populations with the paranoid beliefs of clinical and nonclinical populations existing on a continuum (Chapman & Chapman, 1980;

Claridge, 1997; Strauss, 1969). Delusions in psychosis would represent the severe end of a continuum, but such experiences would be present, often to a lesser degree, in the general population and would be related to milder, attenuated forms of the experience (Freeman, 2006). In accordance with a continuum approach to paranoia, a number of studies have attested to shared commonality between risk factors for nonclinical symptoms and those in clinical disorders. These include trauma (Spauwen, Krabbendam, Lieb, Wittchen & van Os, 2006; van Os, Hanssen, Bijl & Ravelli, 2000), excessive cannabis use and alcohol consumption (Henquet, Murray, Linszen, van Os, 2005; van Os et al., 2000) and urbanicity (Spauwen, Krabbendam, Lieb, Wittchen & van Os, 2004).

1.3 Defining Paranoia

Paranoia is now a term that has moved into the lexicon of everyday language to describe commonplace suspiciousness and feelings of mistrust. These milder variants of paranoia exist alongside severe paranoia classified by the presence of persecutory delusions seen as a defining criteria for psychiatric disorders such as schizophrenia (Freeman, 2007), bipolar affective disorder (Goodwin & Jamison, 1990) and major depression (Haltenhof, Ulrich, & Blanenburg, 1999). Persecutory delusions have been notoriously difficult to define (e.g., Garety, 1985; Harper, 1992; Heise, 1988; Jones, 1999; Strauss, 1969). The implication for empirical research has been that many reports of studies have been unclear about the definition of persecutory delusions they utilized, leading to concerns regarding whether they are indeed studying the same phenomenon (e.g., Freeman, 2007). In a critical commentary, Freeman and Garety (2000) offered a

pragmatic resolution by outlining a set of robust criteria for delusions to be classified as persecutory. The full criteria are presented in Table 1.1.

Table 1.1. *Freeman and Garety's (2000)* c*riteria for defining persecutory delusions*

Criteria A and B must be met:
A. The individual believes that harm is occurring, or is going to occur, to him or her
B. The individual believes that the persecutor has the intention to cause harm
There are a number of points of clarification:
I. Harm concerns any action that leads to the individual experiencing distress
II. Harm only to friends or relatives does not count as a persecutory belief, unless the persecutor also intends this to have a negative effect upon the individual
III. The individual must believe that the persecutor at present or in the future will attempt to harm him or her
IV. Delusions of reference do not count within the category of persecutory beliefs

Crucially, Freeman and Garety (2000) highlight the role of harm and the persecutor's intent as an inherent determinant of whether a delusion can be defined as persecutory. Hence, for an individual to be experiencing a persecutory delusion, the individual must believe that harm is occurring, or is going to occur, to him or her, and that the persecutor has the intention to cause harm. This definition has provided confidence that researchers are indeed studying the same phenomenon giving greater

clarity for effective theoretical development and greater validity to research output (Freeman, 2007). Crucially then, the presence of persecutory delusions does not denote mental ill health; Freeman and Garety's (2000) definition of persecutory delusions is not subsumed within a clinical diagnosis of a psychiatric disorder. Rather, their definition is in line with theoretical and empirical viewpoints that delusions are dimensional and they occur in the general nonclinical population. These criteria have been used to define paranoia both in the clinical (e.g., Green et al., 2006) and nonclinical (e.g., Ellett, Lopes & Chadwick, 2003) populations and will be used within the current research.

An increasingly large evidence base shows that persecutory delusions exist in individuals who do not meet diagnostic criteria for psychosis and are viewed as a form of belief that exists on a continuum of normal human experience (Strauss, 1969). Additionally, the continuum approach also offers a crucial opportunity for the theoretically justified study of paranoia in nonclinical populations to inform the understanding of clinical paranoia (e.g., Bebbington et al., 2013; Combs & Penn, 2004; David, 2010; Freeman, 2010). Nonclinical samples also allow a reduction in the confounding variables likely to alter symptoms such as the use of medication or the comorbid presence of secondary illness (David, 2010). They also offer practical benefits of easier access to larger samples (Freeman et al., 2010).

The following section explores the role that anxiety plays in paranoia, after which an overview of the prevalence of paranoia in nonclinical populations will be provided encompassing prevalence studies (cross-sectional and longitudinal) and experimental paradigms.

1.4 The Psychological Understanding of Paranoia and Anxiety

Cognitive models of persecutory delusions, accounting for their presence across clinical and nonclinical populations, have postulated a number of contributory factors including anomalous experiences, affective processes, reasoning biases and social factors (Freeman, Garety, Kuipers, Fowler, & Bebbington 2002; Freeman, 2007; Freeman & Freeman, 2008; Garety, Bebbington, Fowler, Freeman & Kuipers, 2007). In particular, with regards to affective processes, anxiety is consistently argued to be inherent in paranoia and is likely to play an important role in the formation and maintenance of persecutory delusions (Freeman, Garety & Kuipers, 2001). Freeman et al. (2002) examined the role of anxiety in the development of persecutory delusions, and proposed that similar themes and processes underlie both. Anxiety is a defensive reaction to the anticipation of threat and danger (physical, social or psychological); persecutory delusions are characterised by similar themes referring to perceived danger or harm from another (Michail & Birchwood, 2009). More specifically, it is hypothesized that anxiety is central in the (mis)interpretation of anomalous internal events as threatening, thereby leading to the formation of paranoid threat beliefs (Freeman et al., 2002).

In support of these theoretical frameworks, anxiety has repeatedly been found to be associated with persecutory delusions using multiple methodologies including cross-sectional (e.g., Martin & Penn, 2001), longitudinal (e.g., Freeman et al., 2012) and experimental (e.g., Freeman, Pugh, Vorontsova, Antley, & Slater, 2010). For example, Lincoln, Peter, Schafer and Moritz (2008) reported that the effect of stress on paranoia was mediated by an increase in anxiety, and Freeman, Pugh et al. (2008) found that a 10-point increase on a continuous measure of anxiety was associated with over twice the risk of paranoia and a 20-point increase was associated with over five times

the risk of paranoia. To this end, paranoia can be conceptualised as a type of anxious fear (Freeman, Pugh et al., 2008).

This is a widely held view which the current study also adopts. As such, the current study does not aim to provide additional support for this well-established relationship. Instead, the thesis primarily aims to make steps towards establishing novel relationships between paranoia and additional variables of interest. Consequently, the study design did not additionally include a measure of anxiety. The implications of this are that the present study cannot provide comment on the potentially explanatory role that anxiety may play in understanding and interpreting the findings of this thesis. All results and interpretations are made with this caveat in mind; future research could look to rectify this by including measures of anxiety.

1.5 Investigating Paranoia in the General Population: Survey Studies

One of the largest and most robust epidemiological studies was conducted in the Netherlands by van Os et al. (2000) from a random sample of 7076 men and women aged 18-64 years. Initial data was collected using the Composite International Diagnostic Interview (CIDI; World Health Organisation, 1990), with any respondents endorsing psychotic symptoms provided with a psychiatrist follow-up interview. Crucially, this enabled the Netherland Mental Health Survey and Incidence Study (NEMESIS) to systematically examine the severity of delusions through the removal of any data provided by an individual who could be diagnosed with a psychiatric disorder, and discounting any delusions considered plausible or founded. Using this methodology, van Os et al. (2000) found that 1% of their general population had a "true" psychiatrist-rated delusion, and still 5.8% had a "clinically not relevant delusion"

defined as a belief that does not cause the individual undue distress or induce help-seeking. They found that plausible symptoms, secondary symptoms, and nonclinically relevant symptoms were all very strongly associated with the presence of clinical symptoms; evidence that clinical and nonclinical experiences are linked (Freeman, 2006). The study also found commonality in risk factors (e.g., lower age, urban dwelling, and lower quality of life) and functional measures (e.g., depressive symptoms and blunting of affect) between individuals with or without psychiatrist-rated psychosis. The authors provide this as evidence that the psychosis phenotype as it exists in nature may be nearly 50 times more prevalent than it's purely clinical manifestation. This robust research, described as a "landmark study" by Freeman (2006, p. 203) in his review of delusions in the nonclinical population, shows very convincingly that nonclinical individuals in the general population can experience delusions. It also builds on smaller survey studies of the general population in US samples who reported similar findings (e.g., Eaton, Romanoski, Anthony, & Nestadt, 1991; Tien & Anthony, 1990).

Notwithstanding the striking results regarding the frequency of delusions in the nonclinical population, it can be argued that not all of the delusions reported by van Os et al. (2000) were persecutory in nature. That is, they did not all include the critical element of harm that has to be present in the endorsement of a delusion for it to be defined as persecutory (Freeman & Garety, 2000). Survey studies of British general populations show similar prevalence estimates of delusional beliefs to the European and US population based surveys but are perhaps more relevant here because they do go further to ensuring that delusions are indeed persecutory.

Johns et al. (2004) present the prevalence and correlates of self-reported psychotic symptoms from data in the second UK National Survey of Psychiatric

Morbidity resulting in a large and representative sample of 8560 respondents aged 16-74 years of age. To ensure a purely nonclinical population, respondents with definite or probable psychosis ($n = 60$) were removed following second-phase interviews using the Schedules for Clinical Assessment in Neuropsychiatry (SCAN; World Health Organisation, 1992). Paranoid thoughts were assessed using the Psychosis Screening Questionnaire (PSQ). The study reported that 21% of respondents believed over the past year that there were times when people were against them and 9% of respondents over the same time period felt that people had deliberately acted to harm them. A much smaller percentage, but still 1.5% of the nonclinical representative British sample endorsed the striking persecutory delusion that they believed a group of people were plotting to cause them serious harm or injury. The authors also present similar risk factors shown in their nonclinical population to that of van Os et al. (2000) associated with psychotic symptoms. Specifically the results of a multivariate regression analysis showed that paranoid thoughts were independently associated with neurotic symptoms, victimisation experiences, alcohol dependence, recent stressful life events, average IQ and male gender. The authors report on the consistency of their findings with current cognitive theories regarding the development and maintenance of psychotic symptoms and persecutory delusions (e.g., Garety, Kuipers, Fowler, Freeman, & Bebbington, 2001; Freeman, et al., 2002).

More recent large-scale survey data from the Adult Psychiatric Morbidity Survey in England (APMS 2007; $N = 7281$) using the Psychosis Screening Questionnaire to identify delusional beliefs attests to the reliability of Johns et al.'s (2004) results by reporting very similar prevalence and concomitant data (Freeman et al., 2011). However, despite the focus on delusions as persecutory and the recent

replication of results, methodological criticisms have been levied at Johns et al. (2004) regarding the otherwise rudimental assessment of delusions. Specifically, the measure to assess paranoia was a screening questionnaire for psychotic disorder (the PSQ) which did not capture the fully dimensional nature of delusions (Freeman, 2006; 2007). Additionally the use of lay interviewers may have served to increase the prevalence above that ascertained by clinical interview (Wiles et al., 2006).

To target these limitations, the 2000 British National Psychiatric Morbidity Survey has recently been subjected to a secondary analysis which sought to extend the results of Johns et al. (2004) to identify structural relationships in what the authors' term, the spectrum of paranoid ideation. In addition to data from the PSQ, Bebbington et al. (2013) included data from the questionnaire version of the Structured Clinical Interview for DSM-IV Axis II disorders (SCID-II; First, Gibbon, Spitzer, Williams & Benjamin, 1997). They present a confirmatory factor analysis to suggest that paranoia in the general population can be subcategorised into four clearly defined factors; mistrust, interpersonal sensitivity, ideas of reference and ideas of persecution. Bebbington et al. (2013) support persecutory delusions as being the rarest class of paranoia which, by virtue of the endorsement of persecutory delusions, almost invariably meant that individuals also had the highest rates of other features of paranoia (e.g., mistrust, ideas of reference and interpersonal sensitivity) such that the rarer and odder thoughts – characteristic of clinical presentations – occurred in tandem with the more common and plausible experiences. This non-reflexive relationship between paranoia items, that is, where the less frequent, more severe items were relatively more predictive of other paranoid items is consistent with previous empirical research (e.g., Johns et al., 2004; van Os et al., 2000) and the existence of a continuum of psychotic

symptoms in the general population with actual paranoid persecutory delusions being placed at the extreme end. Bebbington et al. (2013) also report that nonclinical paranoia follows an exponential distribution like that seen with affective symptoms (Meltzer, Tom, Brugha, Fryers & Meltzer, 2002) suggestive of a single population distribution, and not a bimodal distribution (i.e., between 'clinical paranoia' and 'nonclinical paranoia') further supporting that nonclinical paranoia is a phenomenon on its own right (Freeman, Garety, Bebbington, Smith et al., 2005). Overall the authors suggest their results support the existence both of the subcategories of paranoia and an underlying dimension. Movement between categories and along the dimension indicate the process whereby the more extreme forms of paranoia develop, eventually resulting in diagnosable psychotic disorders (Bebbington et al., 2013). The authors highlight the important role of aetiology to explain exactly why particular people move from nonclinical paranoia to clinical paranoia at particular times in their lives. It is possible, and likely, that a wide range of factors are implicated including those in the psychological domain focused on emotional and cognitive attributes (e.g., Hanssen, Bak, Vollebergh & van Os., 2005; Krabbendam et al., 2005), social factors (e.g., Wigman et al., 2011) and the role of appraisal (e.g., Garety et al., 2007; Morrison, French & Wells, 2007).

1.5.1 Survey Studies in Student Populations

Survey studies have also focused on nonclinical paranoia in specific populations to build upon the multi-dimensional perspective of paranoia and provide a deeper account of the phenomenology of nonclinical paranoia deemed lacking from the larger scale surveys (Freeman 2006; 2007). Freeman, Garety, Bebbington, Smith et al. (2005)

present data from a UK student population (*N*=1202) using the specifically designed Paranoia Checklist (PC) to investigate degree of conviction and distress in addition to frequency data for delusional endorsement. Paranoid thoughts occurred regularly in approximately a third of the sample. Delusions of a persecutory nature occurred at similar levels to previous studies, for example, 8% of the sample held the belief at least weekly that someone has it in for them and wanted to cause them harm. As previously found, rarer and more implausible paranoid items (e.g., 'there is a possibility of a conspiracy against me') are held with the strongest levels of conviction and associated with the most distress (Freeman, Garety, Bebbington, Smith et al., 2005). More frequent and distressing paranoia was associated with becoming isolated, giving up activities, and feelings of powerlessness and depression. Freeman, Garety, Bebbington, Smith et al., (2005) present a hierarchy of nonclinical paranoia where severe paranoia (such as persecutory delusions relating to severe threat to the self) may build upon common emotional concerns of mild and moderate threat and social evaluative concerns.

Additional phenomenological approaches to the prevalence of nonclinical paranoia have been taken in student samples. Ellett et al. (2003) used the Paranoia Scale (Fenigstein & Vanable, 1992) a measure specifically designed to measure the incidence of paranoia in a normal college population and the newly developed Personal Experience of Paranoia Scale (PEPS) to investigate individual experiences of paranoia along a number of cognitive, behavioural, and affective dimensions known to be important in clinical paranoia. Within a sample of students (*N* = 324) aged 18-49, 47% reported a clear experience of paranoia as defined by a perception that others acted to intentionally harm them psychologically, physically, or both (Freeman & Garety, 2000). A further 23% reported an experience of paranoia but their descriptions lacked

an explicit statement that others acted with malevolent intent. That said, the scores on the Paranoia Scale for those 23% were statistically significantly higher than those respondents not reporting any paranoia (Ellett et al., 2003). The authors reasoned that the true figure of their sample reporting an experience of paranoia is somewhere between 47% and 70% of the sample. Results from the 153 instances of clear paranoia suggest that paranoia tends to be preoccupying and to have a marked impact on subjective sense of wellbeing. The experience of paranoia was characterised by feeling both judged negatively by others and powerless to stop what was being done. Anger and frustration were the most common affective responses with 69% of respondents reporting to feel this way. The results suggest strongly that paranoia is a common human experience with negative affective and cognitive consequences (Ellett et al., 2003).

Overall, cross-sectional survey studies provide very clear evidence that the proportion of paranoia in the general nonclinical population is strikingly high, and that the experience of persecutory delusions is a phenomenon best viewed on a continuum of normal experience not restricted to clinically diagnosable presentations. Although they provide replicated and strong findings, there are, however, some limitations. By their very design, survey studies are cross-sectional and consequently do not allow for causal associations to be made. As Freeman et al. (2011) acknowledge, although survey data may "indicate the presence of some kind of mechanism, the direction of effect cannot be substantiated" (p. 933). They suggest the triangulation of more sophisticated methodologies involving longitudinal observational studies and experimental manipulations that will permit more substantial inferences of causality (Freeman et al., 2011). The following sections will now detail some noteworthy longitudinal studies

and experimental methodologies used in the study of paranoia in nonclinical populations.

1.6 Investigating Paranoia in the General Population: Longitudinal Studies

Longitudinal methods have been used to track the trajectory of psychotic symptoms over time, and to investigate whether paranoid beliefs in the nonclinical population can be a prodrome for subsequent delusions in clinical populations. The first evidence to suggest the importance of nonclinical symptoms in later clinical manifestations was reported by Chapman, Chapman, Kwapil, Eckblad and Zinser (1994) who reported high rates of psychotic outcomes in individuals who had rated highly on scales of magical ideation and perceptual aberration 10 years earlier. These early studies led to more robust large-scale longitudinal research which focused more specifically on the symptoms of psychosis such as paranoia.

Poulton et al. (2000) provided the first examination of links between childhood and adult symptoms of psychosis. The Dunedin birth cohort tracked psychotic symptoms prospectively in a birth cohort of 761 children in New Zealand who were asked about delusional beliefs and hallucinatory experiences at age 11 and followed up to age 26 years. In comparison to individuals without childhood symptoms, individuals who reported more than one psychotic symptom at age 11 where 16 times more likely to develop a psychiatric disorder by age 26. In terms of attributable risk, 42% of the 26-year-olds diagnosed with psychosis had reported one or more psychotic symptoms at age 11. This suggests that lower states on the paranoia continuum are indeed a risk

factor for more elevated states, and that transitions over the continuum do occur with time (Poulton et al., 2000).

Subsequent studies have also replicated similar results. Hanssen et al. (2005) followed up individuals with incident psychotic experiences after two years to identify transitions to psychotic disorder. They reported an 8% (i.e., 60-fold) increase in risk compared to those without incident psychotic experiences. The 2-year risk rose to 21% for those with multiple psychotic experiences, and to 15% for those whose psychotic experience had arisen in the context of significant lowering of mood (Hanssen et al., 2005). Unfortunately Hanssen et al. (2005) do not isolate delusions specifically within their research such that psychotic experiences may include other phenomenon such as hallucinations and abnormal experiences. Similarly, Poulton et al. (2000) used the Diagnostic Interview Schedule for Children (DISC-C; Costello, Edelbrock, Kalas, Kessler & Klaric, 1982) for the DSM-III (American Psychiatric Association, 1980) to assess psychotic symptomology at age 11. The presence of psychotic symptoms was restricted to only five questions from the schizophrenia subsection of the DISC-C with delusions categorised as present when children answered positively to having had an experience of people spying on them. This does not contain the essence of harm necessary to meet the criteria of being a *persecutory* delusion as defined in the same year by Freeman and Garety (2000).

More recently, Wiles et al. (2006) utilise more specific assessments which do go a little further to parse out persecutory delusions from delusions which are not obviously persecutory and from psychotic symptoms more generally. Wiles et al. (2006) present data from an 18-month follow-up of participants in the British National Survey of Psychiatric Morbidity. Incident cases were those who endorsed one or more

psychotic symptoms at follow-up, who had not done so at baseline to track the trajectory of self-reported psychotic symptoms in the British general population. Of the 1965 participants without psychotic disorders at baseline, 3.3% reported times when they felt people were deliberately acting to harm them, and 0.42% expressed beliefs regarding a group of people were plotting to cause them serious injury or harm. Paranoid beliefs were the most commonly reported of all psychotic symptoms. This supports the notion of persecutory delusions as not only a common phenomenon relative to other psychotic symptoms, but as a phenomenon that can be newly experienced in individuals who had not reported any psychotic symptoms in the preceding 18-month period. The study also investigated risk factors for self-reported incident psychotic symptoms. Individuals living in rural areas, those who had few close friends or relatives, and those who smoked tobacco or drank in a harmful manner had a two to three times greater risk of incident psychotic symptoms. The number of adverse life events was also strongly associated with onset psychotic symptoms and the effect of each of these risk factors was independent (Wiles et al., 2006).

The results are in common with earlier cross-sectional findings from the British National Survey of Psychiatric Morbidity (Johns et al., 2004). The risk factors identified for self-reported psychotic symptoms in the general population share some similarities with the risk factors of those with diagnosable psychotic disorders attesting to the dimensionality of psychotic symptoms. Notably however, Wiles et al. (2006) do not separate out the risk factors for individual symptoms. It is therefore impossible to disentangle the risk factors specifically for the onset of persecutory delusions as separate from the risk factors for other psychotic symptoms they investigated (e.g., thought insertion, strange experiences, and hallucinations).

Longitudinal studies provide evidence for the presence of nonclinical paranoia as a prodrome for clinical paranoia expressed over time. That said, van Os, Linscott, Myin-Germeys, Delespaul & Krabbendam (2009) stress that approximately 75–90% of developmental psychotic experiences are transitory and do disappear over time. What is clearer however, is the frequency of paranoia in the nonclinical population when survey studies (cross-sectional and longitudinal) are taken together. Freeman (2006) reviewed 15 studies to conclude that there is clear evidence that the rate of delusional beliefs in the general population is higher than that of psychotic disorders; delusions are reported by those both with, and without, a clinically diagnosed mental illness and are not confined to clinical populations. As discussed throughout, the frequency of delusional beliefs varies according to the content of the delusion studied, the characteristics of the sample (age, level of urbanity, student or general population), and research methodologies used (psychiatrist rated, lay-person, interview schedules). That withstanding, approximately 1-3% of the nonclinical population have persecutory delusions of a severity comparable to clinical cases of psychosis, and 10-15% of the nonclinical population have fairly regular paranoia including delusions of a persecutory nature (Freeman, 2006).

1.6.1 Limitations of Survey Studies

Survey studies have a number of limitations. Firstly, in terms of the methodological constraints, van Os et al. (2000) highlight that many studies apply clinical measures to nonclinical populations. Do these provide reliable estimates of symptomology in nonclinical populations? Some of the studies reviewed have improved on this and utilised measures specifically designed to assess paranoia in

nonclinical samples (e.g., the PS, PC and PEPS), however these measures are still reliant on self-report to estimate symptom prevalence. Data collection using self-report methods may produce inaccurate and biased information (Barker, Pistrang & Elliott, 2003). For example, some retrospective studies collected data from periods as great as within the past year and are therefore prone to selection and recall bias (Henry, Moffitt, Caspi, Langley & Silva, 1994). When steps are taken to provide some validation for self-report data, Wiles et al. (2006) caution against the use of untrained clinicians who may over report psychotic experiences and who were utilised in a selection of the survey data reported herein. Additional concerns regarding sampling include the fact that people who self-select for research of this kind may be more prone to psychological disturbance (Freeman, Garety, Bebbington, Smith et al., 2005). Indeed, the data may be skewed in the opposite direction because participants may be subject to denial and minimize the presence of symptoms due to the stigmatization of such subject matters (Freeman, Garety, Bebbington, Smith et al., 2005). Specifically regarding student samples, it has been suggested that this population may be prone to overestimating the levels of delusional beliefs compared to samples drawn from the general population (Lincoln & Keller, 2008) and over reporting atypical and low-frequency symptom-like experiences (Merckelback & van de Ven, 2001). Sampling methodologies restricted to student populations are also not epidemiologically representative and make generalization to the wider nonclinical population difficult (Freeman, Garety, Bebbington, Smith et al., 2005). Lastly, the design of cross-sectional surveys do not allow for causality to be inferred. Longitudinal surveys go some way to being more able to assert causal claims, but no survey methods permit the systematic manipulation of moderator or mediator variables to be able to infer causality robustly. A number of

experimental paradigms have been developed to investigate nonclinical paranoia which overcome some of the criticisms outlined above.

1.7 Investigating Paranoia in the General Population: Experimental Paradigms

Three experimental paradigms will now be reviewed including laboratory procedures which manipulate heightened self-awareness and task feedback (Bodner & Mikulincer, 1998; Ellett & Chadwick, 2007), virtual reality paradigms (Freeman et al., 2003; Freeman, Garety, Bebbington, Slater et al., 2005; Freeman, Pugh et al., 2008) and a strategic decision game called the Prisoner's Dilemma Game (PDG; Ellett et al., 2013).

1.7.1 Self-Awareness

A number of experimental studies have used the manipulation of self-awareness in the induction of paranoid thoughts in the nonclinical population. In five experiments, Bodner and Mikulincer (1998) exposed a sample of Israeli student participants to solvable or unsolvable problems with neutral or negative feedback about performance. Attentional focus was manipulated by using a mirror and a video camera and monitor, which were focused either on participants themselves or on the experimenter as a threatening external agent. They found that when attention was focused on the self, personal failure produced depressive-like reactions, but when attention was focused on an external threatening agent, participants showed paranoid-like responses. The findings suggest that paranoia can occur in a nonclinical, albeit student, population when personal failure is experienced as the result of an external agent (Bodner & Mikulincer, 1998).

In a series of studies Ellett and Chadwick (2007) utilised a similar methodology with a larger sample of British students. In their initial study, conditions of high self-awareness produced higher paranoia even when no feedback was given; this is suggestive that for individual's experiencing high levels of self-awareness, even ambiguous feedback can result in increased paranoia. Their second study intimated at the persistence of paranoia once activated; they showed that once feelings of paranoia were present they did not reduce even when self-focus was reduced. In their final study Ellett and Chadwick (2007) incorporated a priming task aimed at boosting or depleting current psychological resources available to participants. The positive priming group had lower scores on the Paranoia Scale (Fenigstein & Vanables, 1992) suggesting that paranoia as a response to task feedback under conditions of high self-awareness can be moderated by the salience of positive self-cognitions. These experimental manipulations show that under conditions of high self-awareness higher paranoia is experienced, that this can be moderated by positive thoughts of the self, and that paranoia, once activated, is persistent.

1.7.2 Virtual Reality Paradigms

Freeman and colleagues have published a series of studies using virtual reality environments to study paranoia using experimentally manipulated virtual reality settings within nonclinical populations. In the largest scale study ($N = 200$) of a representative sample of the local nonclinical adult population, Freeman, Pugh et al. (2008) used a London underground ('tube') train virtual environment populated with computer characters inclusive of an audio recording of typical background noise to increase ecological validity. Persecutory delusions were assessed using the Paranoid

Thoughts Scale (GTPS; Green et al., 2008). Individuals who reported paranoid thoughts in day-to-day life were approximately twice as likely to experience paranoid thoughts in the virtual reality setting compared to individuals who reported no paranoid thoughts in day-to-day life (Freeman, Pugh et al., 2008). Levels of self-reported paranoid thoughts towards the neutral computer characters were high; in excess of 40% of their general population sample reported paranoid thoughts. These findings are consistent with epidemiological studies detailed previously, as well as replicating smaller-scale virtual reality paradigms from Freeman and colleagues using a library scene with participants from the general population (Freeman et al., 2003, $N = 24$; Freeman, Garety, Bebbington, Slater et al., 2005, $N = 30$). Freeman, Pugh et al. (2008) attest to the validity of the virtual reality paradigm in nonclinical populations; the authors report a significant association between trait levels of paranoia and the occurrence of paranoid thinking in virtual reality.

Virtual reality paradigms have provided a novel experimental method for the study of nonclinical paranoia in controlled environments that have afforded some advantages over cross-sectional and longitudinal survey methods. Specifically, the paradigm provides access to participants' current attributions for events rather than purely retrospective views (Freeman, Pugh et al., 2008). Additionally, it perhaps offers more ecological validity than previous experimental methods outlined: preliminary evidence suggests that participants do act in ways synonymous to real life when in virtual reality (Emmelkamp et al., 2002; Glantz, Rizzo & Graap, 2003) and virtual reality is acceptable to participants without causing distress (Valmaggia et al., 2007). It also provides fruitful areas for future research including exploration of the causal roles of psychological processes in the development and maintenance of nonclinical paranoia

which can be established by their manipulation before participants enter virtual reality (Freeman, Pugh et al., 2008). Nonetheless, disadvantages are still apparent. The general accessibility to research and clinical teams is hampered greatly by the costs and technology requirements of virtual reality and indeed, previous laboratory studies that have still required access to specialist audio-visual equipment. Also, as pointed out by the authors (Freeman, Pugh et al., 2008; Freeman et al., 2010) despite the futuristic nature of virtual reality, the paradigms have still been unable to improve upon the use of self-report for the assessment of paranoia. Freeman et al. (2010) state in their defence "no other markers of the experience are available" (p. 263). The following section will detail a third, novel experimental method that seeks to provide such a marker in nonclinical populations.

1.7.3 The Prisoners Dilemma Game (PDG)

The PDG involves two players, who make a simple choice either to cooperate with or compete against each other without discussion (Ellett et al., 2013). Each choice to cooperate or compete is attached to a unit of reward or outcome. The central dilemma faced by the players is that each can maximise outcomes by competing, yet, paradoxically, when both players choose to compete, their outcomes are lower than the outcomes they can achieve by mutual cooperation. Ellett et al. (2013) predicted that participants experiencing paranoia about their opponent would be more likely to compete in the PDG because they appraised their opponent as malevolent, and competition provides the best defensive strategy against a malevolent other (Ellett et al., 2013).

The authors conducted three studies using the PDG with a nonclinical sample. Measures included the behavioural choice to compete or cooperate in the PDG, a measure of trait paranoia (Paranoia Scale, PS; Fenigstein & Vanable, 1992) and a measure of state paranoia specifically developed for the research (State Paranoia Scale, SPS; Ellett et al., 2013). In the first study ($n = 175$), correlational analysis showed that state paranoia was positively associated with the choice to compete in the PDG. This provided preliminary evidence that the PDG can be used to study nonclinical paranoia. The second study, ($n = 111$) provided replication of this result, but went further in showing that the relationship between state paranoia and competition only held when participants believed they were competing against another player, and not against a computer. This provides the first empirical evidence that paranoia is inherently interpersonal in nature – one can only feel paranoid about another person or group of people. In their final study ($n = 152$), the authors address limitations to the previous two studies and seek to clarify two issues; firstly, to elucidate on the motives for competition, and secondly, to establish the role of trait paranoia. Motivation to compete in the PDG may stem from greed-based motives (competing to maximise outcomes based on the prediction the other player will cooperate) or distrust-based motives (competing to defend against the other player based on the prediction that they will also have competed). The distinction between greed and distrust is significant because only distrust-based competition would be expected to be associated with paranoia, through the belief that the other person will act in a way to intentionally cause harm (i.e., to compete and be rewarded with maximum outcomes) (Ellett et al., 2013). The authors included a measure of PDG choice reasons (Insko, Kirchner, Pinter, Efaw, & Wildschut, 2005). They found that both state and trait paranoia were positively associated with distrust-based competition but not with greed-based competition.

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Furthermore, state paranoia meditated the link between trait paranoia and distrust-based competition because it predisposed participants to experience state paranoia in the interpersonal PDG context (Ellett et al., 2013).

Across the three studies, all found significant relationships between state paranoia and competition in the PDG attesting to the efficacy of using this paradigm for the study of nonclinical paranoia. The studies empirically underscored the interpersonal nature of paranoia, leading the authors to conclude the concomitant necessity of studying paranoia in an interpersonal context for which the PDG is ideally suited. Inherent in the PDG paradigm, making it additionally suited to the study of paranoia, is that it concerns threat and the perception of another's intentions towards the self (Ellett et al., 2013). Because each player is unaware of the decision of the other player, feedback on their performance is ambiguous which has also experimentally been shown to cause paranoia in a nonclinical population (Ellett & Chadwick, 2007). Similar to the virtual reality paradigm, the computerised nature of the PDG allows for a controlled interpersonal context which can be systematically manipulated (Owens, Berry & Ellett, 2014). Unlike virtual reality paradigms, the PDG has the inherent advantages of being transportable and inexpensive. As Owens et al. (2014) note, this makes it superior to other paradigms in terms of ease of administration and perhaps allows for relatively high levels of recruitment. Although these initial results would benefit from replication across wider samples of a representative population to further attest to their reliability and validity, Ellett et al. (2013) present their results as the first paradigm for assessing nonclinical paranoia not solely reliant on self-report measures. Unlike all previously summarised studies which have had to rely on self-report measures of retrospective paranoia, this novel experimental paradigm provides

compelling evidence for conceptualizing distrust-based competition in the PDG as a real-time behavioural signature for paranoia in the nonclinical population (Ellett et al., 2013).

In addition to replication, the authors conclude that there are a number of areas of research that can be investigated to further develop this paradigm. Specifically, they highlight that future research on paranoia using the PDG might consider a wider range of motivations beyond which they considered. Ellett et al. (2013) clearly showed that distrust-based PDG competition is associated with nonclinical paranoia. Outstanding questions remain in terms of whether further motivations may also play a causal role in promoting PDG competition that may also be associated with paranoia. The following section considers how the social psychology literature on human values may provide examples of such motivations. Our values guide our behaviour, allowing us to make reasoned decisions. Could human values act as a guide to the decision regarding whether to cooperate or to compete in the PDG? If so, are there certain values that are associated with the decision to compete which may also be associated with paranoia? There is no research currently available which examines paranoia in the nonclinical population and the role that human values may play in guiding behaviour to build upon the results of Ellett et al. (2013). A consideration of how human values could provide this is presented next, including background information and relevant empirical research.

1.8 Values Theory: What are Values?

Values convey what is important to us in our lives (Calogero, Bardi & Sutton, 2009).

Values are defined as broad goals that guide people's perceptions, attitudes, and

behaviours across contexts, cultures, and time (e.g., Rokeach, 1973; Schwartz, 1992).

Value theorists have adopted a view of values "as the criteria people use to select and

justify actions and to evaluate people (including the self) and events" (Schwartz, 1992,

p.1). Individuals hold different values with varying degrees of importance. A particular

value may be very important to one person but unimportant to another (Schwartz,

2005). There is a large literature discussing the antecedents to the development of any

individuals' personal values. The general view is that values develop from multiple

combinations of sources including socialization, life experiences, personality traits,

individual needs and culture (e.g., Kluckhohn, 1951; Meglino & Ravlin, 1998;

Rokeach, 1973; Schwartz, 1992).

Values are viewed as central aspects of the self (e.g., Brewer & Roccas, 2001;

Rokeach, 1973). Because of this, values are relatively stable and are expected to be less

amenable to change than attitudes and needs (e.g., Konty & Dunham, 1997), although

there is now some preliminary evidence of predictable value change having direct

implications for the possibility of behavioural change (Bardi & Goodwin, 2011).

Schwartz and Bilsky (1990) defined values as cognitive structures that can be retrieved

from memory with conscious awareness on demand. Hence, people know what their

values are and they can be measured directly by asking people to rate their importance

(Bardi & Goodwin, 2011). More interestingly, values may also operate without

consciousness (Schwartz, 1996). Bardi & Schwartz (2003) showed that people are

motivated to act according to their values without being consciously aware of the driving force of these values at the time of action.

In a review of the nature of values Schwartz (2005) highlights a general conception of values held in the values literature that specifies six main features that are implicit in the writings of many theorists (e.g., Allport, 1961; Feather, 1995; Inglehart, 1997; Kluckhohn, 1951; Kohn, 1969; Morris, 1956; Rokeach 1973; Schwartz & Bilsky, 1990.)

1. *Values are beliefs linked inextricably to affect.* When values are activated, an individual may become infused with feeling. People for whom one value is important may become aroused if this value is threatened, but satisfied when their actions are directly pursuing this value.

2. *Values refer to desirable goals that motivate action.*

3. *Values transcend specific actions and situations.* Values will remain relevant across the different settings an individual spends time in (e.g., work or school), across different pastimes they engage in (e.g., in sports, business, or politics) and across a wide variety of people with whom they interact (e.g., family, friends, or strangers). This feature distinguishes values from narrower concepts like norms and attitudes that usually refer to specific actions, objects, or situations.

4. *Values serve as standards or criteria*. Values guide the selection or evaluation of actions, policies, people, and events. People decide what is good or bad,

justified or illegitimate, worth doing or avoiding, based on possible consequences for the values that are important to them. Values enter awareness when the actions or judgments one is considering have conflicting implications for different values that one holds to be important.

5. *Values are ordered by importance relative to one another*. A person's values form an ordered system of value priorities that characterize them as individuals. This hierarchical feature also distinguishes values from norms and attitudes.

6. *The relative importance of multiple values guides action*. Any attitude or behaviour typically has implications for more than one value. The trade-off among relevant, competing values is what guides attitudes and behaviours (Schwartz, 1992, 1996). Values contribute to action to the extent that they are relevant in the context (hence likely to be activated) and important to the individual.

1.8.1 The Theory of Basic Human Values (Schwartz and Colleagues)

Two decades ago, Schwartz (1992) proposed what has become the most fully elaborated, empirically grounded and widely used theory of basic human values (Cieciuch et al., 2013). Schwartz and colleagues' theory of basic human values has been developed and advanced in light of empirical evidence across many iterations (e.g., Schwartz & Bilsky, 1990; Schwartz, 1992; Schwartz, 2005; Schwartz et al., 2012). Recently, Schwartz et al. (2012) presented their most refined theory, which identified a continuum of 19 meaningful, conceptually distinct values. The refinement

of the theory does not imply previous theories to be incorrect; merely, as per Karl Popper's scientific method, better theories replace poorer ones because they explain existing observations more effectively (Cieciuch et al., 2013). As such, Schwartz et al.'s (2012) refined theory of basic human values provides greater universal heuristic and predictive power then previous versions. The 19 basic human values and the motivational goal each value is driven by is described in Table 1.2.

Table 1.2. *The 19 basic values in Schwartz et al.'s (2012) values theory, each defined in terms of their higher-order values and motivational goal*

Higher order values	Basic value	Motivational goal
Openness to change	Self-direction–thought	Freedom to cultivate one's own ideas and abilities
	Self-direction–action	Freedom to determine one's own actions
	Stimulation	Excitement, novelty, and challenge in life
	Hedonism	Pleasure and sensuous gratification for oneself
Self-enhancement	Achievement	Personal success according to social standards
	Power–dominance	Power through exercising control over people
	Power–resources	Power through control of material and social resources
	Face	Security and power through maintaining one's public image and avoiding humiliation
Conservation	Security–personal	Safety in one's immediate environment
	Security–societal	Safety and stability in the wider society
	Tradition	Maintaining and preserving cultural, family, or religious traditions
	Conformity–rules	Compliance with rules, laws, and formal obligations
	Conformity–interpersonal	Avoidance of upsetting or harming other people
	Humility	Recognizing one's insignificance in the larger scheme of things
Self-transcendence	Benevolence–dependability	Being a reliable and trustworthy member of the in-group
	Benevolence–caring	Devotion to the welfare of in-group members
	Universalism–concern	Commitment to equality, justice, and protection for all people
	Universalism–nature	Preservation of the natural environment
	Universalism–tolerance	Acceptance and understanding of those who are different from oneself

[a]As described by Cieciuch, Davidov, Vecchione, Beierlein, and Schwartz (2014) hedonism is located on the border of openness and self-enhancement values, and is included here in the model for openness. [b]Face is located on the border of self-enhancement and conservation values, and it is included here in the model for conservation. [c]Humility is located on the border of conservation and self-transcendence values, and is included here in the model for conservation.

1.8.2 The Motivational Continuum

Classically, the 19 basic values are presented in a circular continuum as can be seen in Figure 1.3. This representation models the fact that each value is related to the other values in an organised, coherent manner (Schwartz, 1992). The total pattern of conflict and compatibility between values gives rise to a circular structure referred to as a 'motivational continuum' (Schwartz, 1992). Competing value types emanate in opposing directions from the centre; complementary types are in close proximity going around the circle in light of shared motivational orientations for adjacent values (Bilsky & Schwartz, 1994). This determines that adjacent values in the circle can be easily pursued with the same actions whereas opposite values in the circle are often impossible to pursue with the same actions. For example, by following a specific tradition one can fulfil both tradition values and conformity values, and yet, by the same action one is likely to violate values of stimulation and self-direction (Calogero et al., 2009). As a result, most people who tend to endorse a particular value tend to also endorse adjacent values and not to endorse opposite values in the circle.
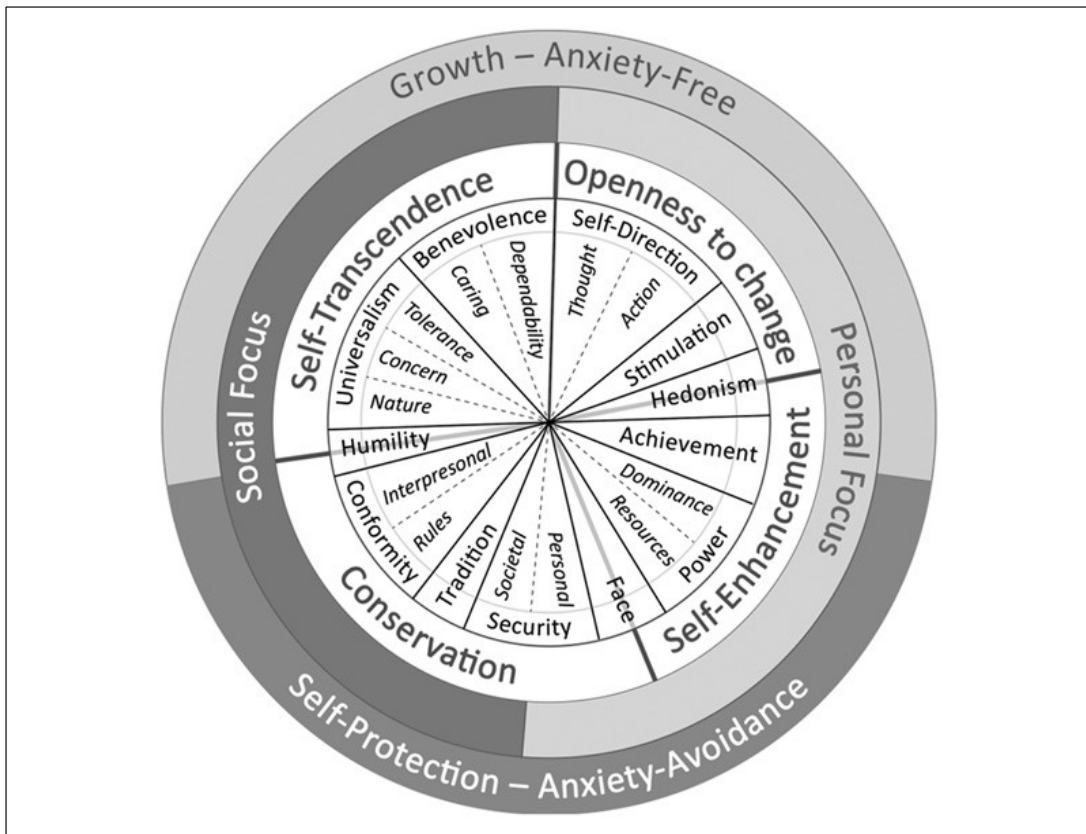
Figure 1.3. The circular motivational continuum (Schwartz et al., 2012). Taken from Cieciuch et al. 2013.

Schwartz (2005) highlights that actions in pursuit of values have practical, psychological, and social consequences. Practically, choosing an action that promotes one value (e.g., drug taking; based on the value of stimulation) may literally contravene or violate a competing value (e.g., following the dictates of one's religion; based on the value of tradition). The person choosing what to do may also sense that such alternative actions are psychologically dissonant; indeed, others may impose social sanctions by pointing to practical and logical inconsistencies between an action and other values the person professes (Schwartz, 2005).

In addition to the categorisation of 19 human values, the structure of Schwartz et al.'s (2012) theory also includes higher order classifications with the motivational continuum. As can be seen in Figure 1.2, the circular structure of the 19 basic values are bounded by another three circular rings. These additional rings allow for further empirically driven categorisation of the 19 values into wider concepts and the circle of values can be partitioned for scientific convenience in many different ways. Depending on the aims of a study, one might distinguish fewer broadly defined values or more narrowly defined values (Cieciuch et al., 2014). This structure also has important consequences for how values can be understood to have their motivational effect on an individual. Schwartz et al. (2012) elucidate that values bounded by the top half of the outermost circle express growth and self-expansion and are more likely to motivate people when they are free of anxiety. The values bounded by the lower half of the outermost circle are directed toward protecting the self against anxiety and threat. The values on the right in the next circle have a personal focus; concern with outcomes for self. Those on the left have a social focus; concern with outcomes for others or for established institutions. The second circle from the centre indicates the boundaries between the four higher order values into which values can be grouped. Openness to change values emphasize readiness for new ideas, actions, and experiences. They contrast with conservation values that emphasize self-restriction, order, and avoiding change. Self-enhancement values emphasize pursuing one's own interests. They contrast with self-transcendence values that emphasize transcending one's own interests for the sake of others. The innermost circle displays the 19 values as they are subsumed within their higher-order value (one of four; openness to change, self-enhancement, conservation, self-transcendence), and the broader categorization of each value having a societal focus vs. personal focus, and whether pursuit of the value aims

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to avoid anxiety and fosters growth vs. pursuit of the value is relatively anxiety provoking and serves a self-protecting function.

1.8.3 Values Theory and the PDG

A major goal of research within the values literature has been to relate individual differences in value priorities to differences in attitudes, behaviour, and background variables (Schwartz, 1996). Indeed, one such behaviour is interpersonal cooperation which Schwartz (1996) investigated using an adapted version of the PDG in relation to the values held by a sample of nonclinical participants ($N = 90$). The author also notes that games such as the PDG are constructed to tap behaviours that express relatively pure behavioural motivations straightforwardly which make them ideal for hypothesis testing. The PDG requires an individual to choose between competing and cooperating. Such decisions are likely to reflect the motivational goals they expect to attain by their actions (i.e., their values) even when individuals do not consider their values explicitly (Sagiv, Sverdlik & Schwarz, 2011). For this task of interpersonal cooperation, Schwartz (1996) predicted the relevant value dimension was self-enhancement (these individual-orientated values include power and achievement) versus self-transcendence (these collective-orientated values include benevolence and universalism). As predicted, Schwartz (1996) found that the value of power was most negatively associated with the decision to cooperate with a point-biserial correlation of -.37. Schwartz's (1992) conceptual definition for the motivational goals for valuing power is for social status and prestige, and control or dominance over people and material resources. Therefore, power emphasizes competitive advantage; pursuing power values legitimizes seeking maximum own gain even at the expense of others (Schwartz, 1996). As predicted by

values theory, benevolence (r_{pb}=.38) and universalism (r_{pb} =.32) were most strongly associated with the decision to cooperate due to their location as polar opposites on the circular values structure. Consistent with the author's predictions, low correlations were found for values less relevant to the task's decision to cooperate or compete, including self-direction, stimulation, tradition, and security. Therefore, a commitment to values that promote cooperation (benevolence), in the absence of conflict with a commitment to values the promote self-transcendence (e.g., power), was necessary to elicit a high level of cooperation using the PDG paradigm (Schwartz, 1996). Conversely, a commitment to values that promote power, in the absence of conflict with a commitment to values that promote benevolence was necessary to elicit a high level of competition in the PDG.

1.9 Paranoia, Values and the PDG

Schwartz (1996) showed that the decision to compete on the PDG was motivated by the value of power i.e., having control or dominance over people or material resources. Ellett et al. (2013) later utilized the PDG paradigm to show that the decision to compete was associated with paranoia in the nonclinical population. Empirically then, considering these pieces of research in combination, the value of power may be expected to be associated with nonclinical paranoia.

Theoretically however, there is reason to predict that power is not the most likely value to be associated with paranoia. When Ellett et al. (2013) looked at the motivations that participants used to cooperate or compete on the PDG, they showed that only distrust-based PDG competition (and not greed-based competition) was

associated with paranoia. This in interesting for two reasons. Firstly, the construct of greed and the value of power are more closely linked theoretically than are the construct of distrust and value of power. Greed and power are concerned with similar aims, that is, to have control and dominance over resources. It therefore seems theoretically less likely that *distrust*-based PDG competition (rather than *greed*-based competition) and the value of power would be associated. Secondly, the construct of distrust is more closely linked theoretically to the value of security. Taking a theoretical perspective, there is a clear rationale to link paranoia and security values. Persecutory delusions are defined as beliefs that another person is acting in a way to intentionally cause one harm (Freeman & Garety, 2000). Paranoia therefore relates to mistrust and suspicion (Freeman et al., 2011). Within their cognitive model of persecutory delusions, Freeman et al. (2002), conceptualise persecutory delusions as threat beliefs. As with any threat belief, the normative response is anxiety and a desire to protect oneself. Within Schwartz et al.'s (2012) value theory, the value of security sums this position up well; the conceptual definition of security is 'safety in one's immediate environment' (security-personal) and 'safety and stability in the wider society' (security-personal). When paranoid, we are threatened and it is likely we would hold values that are underpinned by maintaining safety for oneself (e.g., security) above those that focus in that moment on dominance and control (e.g. power). One tentative concept is that the extent of paranoia that one feels in any given moment might be associated dynamically with one's value priorities. Perhaps paranoia has a moderating effect on value priorities which would help to pick apart the potential empirical and theoretical links with both power and security values.

As predicted by the motivational continuum of value priorities, people who tend to endorse a particular value tend to also endorse values which are adjacent in the circle, and tend not to endorse the values which are opposite in the circle (Calogero et al., 2009). In line with our predictions that nonclinical paranoia will be positively associated with the adjacent values of power and security, we also predict it will be most negatively associated with the values which lie opposite. Namely, these are the values subsumed within the higher-order value of self-transcendence of universalism and benevolence. Self-transcendence involves a commitment to actions that transcendence one's own interests and elevates the interests of others (Schwartz et al., 2012). Self-transcendence values are at clear odds to those of power and security; a commitment to power reflects pursuing one's own interests for material gain, and a commitment to security reflects the restriction of oneself for self-protection. Benevolence is defined as 'being a reliable and trustworthy member of the in-group' (benevolence-dependability) and 'devotion to the welfare of the in-group members' (benevolence-caring). A commitment to benevolence values is unlikely to be of priority for those experiencing paranoia. Similarly, the value of universalism as defined by holding commitments to equality, justice, and an acceptance and understanding of those who are different to oneself, are not likely to be associated positively by those experiencing persecutory paranoia. Empirical support to these theoretically driven predictions is offered from Schwartz (1996) who found that benevolence and universalism were the most negatively associated values to the decision to compete in the PDG. He also found that the other values in the motivational continuum had near zero correlations to the decision to compete.

In summary, empirical and theoretical rationale exist to predict that different values will be associated positively and negatively with paranoia and the decision to compete on the PDG. When combining the research of Schwartz (1996) and Ellett et al. (2013) there exists empirical support to suggest that the value of power will be positively associated with paranoia and the decision to compete in the PDG, and that the values of benevolence and universalism will be most negatively associated with the paranoia and the decision to compete. On theoretical grounds when considering the threat based nature of paranoia, the value of security is more likely to be associated with paranoia and the decision to compete in the PDG. No other research exists to explore nonclinical paranoia and values. In this sense aspects of the current research are exploratory as well as having some empirical and theoretical rationale on which to make specific, albeit, tentative predictions.

1.10 Aims of the Current Research

The current research aims to replicate and extend research into nonclinical paranoia and values. The aims of this thesis are explored and discussed in 4 sections corresponding to the 4 broad research areas within which the individual hypotheses are located.

1.10.1 Research Area 1: Paranoia and Values

The first aim of the current research was to explore the 19 basic human values in relation to a novel area of association (i.e., nonclinical paranoia) to provide evidence for the explanatory power of values in relation to behaviour and extend the knowledge base of Schwartz et al. (2012)'s refined theory of human values. The aim was to explicate the

relationship between paranoia in the nonclinical population and values to ascertain what values will be most and least associated with paranoia. One prediction was made:

Hypothesis 1) The values of power, security, benevolence and universalism will be associated with trait paranoia.

1.10.2 Research Area 2: Paranoia and the PDG

The second aim of the current research was to replicate the finding of Ellett et al. (2013) that distrust-based competition on the PDG is a behavioural marker for nonclinical paranoia to provide additional empirical support for the use of the PDG in this research area. Three predictions were made:

Hypothesis 2a) Trait and state paranoia will be associated with the behavioural choice to compete in the PDG.

Hypothesis 2b) Trait and state paranoia will be positively associated with distrust motives but not greed motives in the PDG.

Hypothesis 2c) Distrust will mediate the effect of trait paranoia on the behavioural choice to compete in the PDG.

1.10.3 Research Area 3: Values and the PDG

The third aim of the current research was to extend the research of Ellett et al. (2013) and broaden our understanding of paranoia in the nonclinical population by looking to the literature on human values as potential motivations for competition on the PDG. One prediction was made:

Hypothesis 3) The values of power, security, benevolence and universalism will be associated with behavioural choice in the PDG.

1.10.4 Research Area 4: Paranoia, Values and the PDG

The fourth aim was to combine the three areas of research of nonclinical paranoia, the PDG and human values theory to establish whether more complex interactions between paranoia and values are associated with PDG competition. Two predictions were made:

Hypothesis 4a) Valuing power and security will predict PDG competition when moderated by trait paranoia.

Hypothesis 4b) Valuing power and security will mediate the effect of trait paranoia on PDG choice.

METHOD

2.1 Overview

The method section begins by outlining the study design including power calculations, a description of the participants who formed the sample and the recruitment strategy employed. Details of socio-demographic data collected in the study, the questionnaire measures used and the Prisoners Dilemma Game (PDG) procedure are then provided. This is followed by an outline of how the data capture program was developed. Next, a full detailed procedure is given. Lastly, the ethical considerations of the study are discussed along with the steps taken to address these.

2.2 Design

The current study uses a cross-sectional design. It comprises one dichotomous variable of PDG choice (cooperate or compete) and the associations between variables measuring paranoia (state and trait), PDG choice reasons and human values.

2.3 Power Analysis

A priori power analyses were conducted to ascertain the number of participants required for the current study. Ellett et al. (2013) is the sole study to have examined paranoia and the PDG. They performed a point-biserial correlation on state paranoia and choice on the PDG, yielding a correlation coefficient of .20, indicating a small-medium effect size according to Cohen (1992). In addition, within values theory literature relevant to the current study, Schwartz et al. (1996) found a negative correlation (.37) between the

value of power and participants' decision to cooperate on the PDG. This is a medium effect size (Cohen, 1992). An effect size between small (.10) and medium (.30) at .20 was chosen for the current study as it minimizes the chance of missing an effect that exists (i.e. a Type II error). As devised by Cohen (1992) for an effect size of .20, with power set at the conventional level of 0.8 and alpha at 0.05, approximately 195 participants were needed for a two-tailed test.

2.4 Sample

The full experimental sample ($N = 221$) was obtained from a nonclinical population. There were no cases with incomplete data. Participants who indicated previous personal contact with mental health services ($n = 39$) were not excluded from the analysis as statistical tests indicated no significant differences between the main variables of interest and the rest of the sample. Consequently, the current research can be confident it is sampling nonclinical paranoia. The sample comprised 129 female participants (58%) and 92 male participants (42%) all between the ages of 18 and 65 years old (mean age = 23.23; $SD = 6.79$ years). Further demographic information is provided in Results (section 3.3, page 69).

2.5 Recruitment

The study employed convenience sampling methods (Barker et al., 2003). Undergraduate and postgraduate participants from Royal Holloway University were recruited to the study via poster advertisements pinned to noticeboards throughout campus and via the electronic 'campus noticeboard' intranet facility. Students from

other British universities were also approached via email. So as not to be constrained by a purely student sample, other methods were employed such as Facebook, gumtree and a local poster campaign. All methods provided a summary of the study and the web address allowing direct access for participation. The study was completed online. Participants were only required to have access to an internet enabled computer, and could therefore take part anywhere across the country.

2.6 Measures

2.6.1 Socio-Demographic Information

Socio-demographics were collected for age, gender, employment, education and marital status, number of children, ethnic or cultural group, religion, and previous contact with mental health services. A copy of the socio-demographic questions asked can be found in Appendix A.

2.6.2 *Values*: Portrait Values Questionnaire-Revised (PVQ-R; Schwartz et al., 2012)

This questionnaire assesses a person's value system. The PVQ-R defines 19 values. Each value has three items that portray a person's goals, aspirations or wishes that point implicitly to the importance of that value (Schwartz et al., 2012). The questionnaire has 57 items in total. For each item, respondents are presented with a statement such as '*He/she thinks it is important to be ambitious*' and are asked to indicate how similar the person is to themselves on a 6-point Likert scale (*1= not like me at all, 6= very much like me*). The PVQ-R has a male and female version to accommodate this structure. Data gathered in 2010 across 10 countries (*N = 3,261*) supports this model of human

values. Confirmatory factor analysis for the model shows acceptable goodness of fit indexes for the Standardized Root Mean Residual (SRMR) at .046 and the Root Mean Square Error of Approximation (RMSEA) at .045 (SRMR and RMSEA values of <.05 are considered to indicate good fit). The Comparative Fit Index (CFI) is .869, just below the .90 (or higher) desired value for goodness of fit (Bentler, 1990). However, Schwartz et al. (2012) note that even in correctly specified models CFI tends to worsen as the number of variables in a model grows large (Kenny & McCoach, 2003). They suggest that there may be no real cause for concern if the CFI is lower than expected if the RMSEA seems better. The RMSEA of .045 does indicate good fit suggestive of a reliable model. Indeed Schwartz et al. (2012) conclude that the analyses provide substantial support for the refinement of the theory of basic human values. A copy of the PVQ-R can be found in Appendix B.

2.6.3 *Trait Paranoia*: Paranoia Scale (PS; Fenigstein & Vanable, 1992)

The PS is the most widely used dimensional measure of paranoia (Freeman, Garety, Bebbington, Smith et al., 2005). This questionnaire was specifically designed by Fenigstein and Vanable to assess self-reported paranoid cognitions in college student samples and specifically includes ideas of persecution. The measure consists of 20 items. For each item participants rate their agreement on a 5-point scale (*1= not at all applicable to me, 5= extremely applicable to me*), yielding a score range from 20 to 100. Higher scores indicate higher levels of nonclinical paranoia. Fenigstein & Vanable (1992) reported an overall alpha of .84 across four different samples of university students ($N = 581$) implying good internal consistency and good test-retest reliability after a relatively long re-test period of 6 months (.70). The authors also report good

normative data with a mean total score of 42.7 (*SD* = 10.2) within a range of 20-100. They conclude there to be sufficient variation in scores to consider the instrument suitable for use in a college population. A copy of the PS can be found in Appendix C.

2.6.4 *State Paranoia*: State Paranoia Scale (SPS; Ellett et al., 2013)

This is a four item scale developed by Ellett et al. (2013) to measure a momentary experience of paranoia specifically within the context of the PDG. Similar to the State Social Paranoia Scale (SSPS; Freeman et al., 2007) all items on the SPS have the two elements of feared harm and intention necessary to be assessing clear persecutory thinking as defined by Freeman and Garety (2000). Participants are asked to rate how they anticipate experiencing the other participant by marking responses on a 7-point Likert scale anchored with two opposing statements. One pole of each item clearly indicates an explicit perceived intention of harm, a defining characteristic of paranoia (Freeman & Garety, 2000). The four items are: "*is hostile to me*" vs. "*is friendly towards me*"; "*wants to please me*" vs. "*wants to upset me*"; "*wants to help me*" vs. "*wants to harm me*"; and "*respects me*" vs. "*has it in for me*". Higher scores indicate greater state paranoia toward their opponent in the PDG at the time of response. The possible range of scores is 4-28. Ellett et al. (2013) present pilot study data using an undergraduate sample (*N = 162*). A factor analysis revealed a single factor explaining 75% of the total variance. All four SPS items loading highly on to this factor (factor loadings > 0.6). The SPS shows good internal consistency (Cronbach's alpha = .92). In an additional pilot study (*N = 286*) the authors present a significant positive correlation (*r* = .415, *p* = .0005) between Fenigstein and Vanable's (1992) Paranoia Scale, a validated measure of trait paranoia (see Methods, section 2.6.3, page 54), thus

attesting to the SPS's good construct validity. A copy of the SPS can be found in Appendix D.

2.6.5 *Distrust-Based vs. Greed-Based Competition:* Closed Reasons Assessment (Insko et al., 2005)

This self-report measure assesses various reasons for choice in the PDG. It is an 11-item measure with each item presented as a statement indicating a potential concern that may have influenced a PDG choice (e.g., "*I wanted to maximise my earnings*"). Each statement is rated on a 7-point Likert scale (*1= not at all like me, 7 = very much like me*). Distrust was specifically measured with the following two statements: "*I wanted to defend myself against the actions of the other person*" and "*I did not trust the other person*". Greed was measured with the following two different statements: "*I wanted to earn more than the other person*" and "*I wanted to maximise the difference between both persons in my favour*". Composite measures of distrust and greed are ascertained by averaging across the relevant items. The authors reported good internal consistency for distrust (Cronbach's alpha .71) and greed (Cronbach's alpha .89). A copy of the closed reasons assessment can be found in Appendix E.

2.6.6 *Behavioural Measure of Paranoia:* Prisoners Dilemma Game (PDG)

The PDG involves two players who make a choice to cooperate with each other or compete against each other (Ellett et al., 2013). Within the PDG the best outcome is to compete, however if both players choose to compete they receive less than if they had both chosen to cooperate. The payoff matrix used in the current study can be seen in

Figure 2.1. The values shown for each player represent the 'payoff' each player receives depending on their decision (to cooperate or compete) *combined with* their opponent's decision (to cooperate or compete). For example, if both players choose to cooperate they each receive 90 credits. If 'you' choose to cooperate but 'the other player' chooses to compete, 'you' would receive 30 credits and 'the other player' would receive 120 credits.

THE OTHER PLAYER \ YOU	Cooperate X	Compete Y
Cooperate X	90 / 90	120 / 30
Compete Y	30 / 120	60 / 60

Figure 2.1. Prisoner's Dilemma Game Matrix

2.7 The Online Data Capture Programme

2.7.1 Programme Development

The study was developed as an online program accessible via a web address (see Appendix F for screen shots of the programme). Development of the online programme took place over a 10 month period between November 2012 and September 2013. A version of this programme already existed having formed part of the doctoral thesis for a previous trainee. Some elements were retained for the present study including the PS, the SPS and the closed reasons assessment which were already in an easy-to-use online format. It also included the PDG which was itself modelled on extensive research (e.g., Cohen, Wildschut, & Insko, 2010; Wildschut, Insko, & Gaertner, 2002; Ellett et al., 2013). The online program was attached to a secure database. At the point when participants completed the study and consented to their data being used, the data was automatically uploaded to the database. If participants chose to withdraw their data from the study, this was recorded in the database. Data from participants who had only partially completed the study was not uploaded to the database.

This version of the online program was used as a framework for the present study with the necessary modifications undertaken in close liaison with the support of the university's IT department. Specifically, the first stage of development involved designing the PVQ-R male and female questionnaires into online formats complimentary to the three questionnaires already present. The information and debrief pages necessary for this study were also added. Further developments included adding withdrawal options on every page in the form of a 'withdraw' box. This included a confirmatory pop-up window to minimise withdrawal errors whilst allowing participants their right to withdrawal. Confirmatory pop-up windows were also added

for any missed questions; the pop-up highlighted which questions had been missed within a questionnaire when participants clicked the 'next' button to progress to the next part of the study. This allowed participants to skip questions intentionally if they wished to do so whilst preventing unintentionally missed questions which would compromise the completeness of the dataset. Lastly, unique participant identifiers were assigned automatically to each participant's data within the secure database. This provided a method for uniquely storing participant data and preserving anonymity and confidentiality which did not necessitate participants contacting the researcher for an identifier beforehand. This method allowed participants the ability to take part in the online study immediately from when they had access to the web address.

2.7.2 Programme Testing

The program was then tested extensively to identify and remedy any remaining bugs and to ensure its compatibility with the major internet browsers (e.g., Firefox and Google). The program was then piloted with five people from the general population who were representative of the target sample. Each pilot participant completed the online study and were asked for feedback. Specifically they were asked to comment on acceptability of the interface; acceptability of the time to complete; clarity of the PDG instructions; and for any technical problems. One minor amendment was made to the wording of the question pertaining to previous mental health contact in order that there was no ambivalence as to whether this contact was in a personal or professional capacity. The question was altered to read; 'Have you had previous contact with mental health services for personal reasons?' This was an important methodological amendment as it provided data to ensure the study was sampling from a nonclinical

population. It was also discovered that the study did not work on mobile devices (e.g., smart phones or iPads) because javascript (a computer programming language which forms an integral part of the online game) is not compatible on the majority of these devices. Consequently, all advertising methods were altered to alert participants that the study must be completed on laptops or PCs. No further adjustments were made following the pilot feedback.

2.8 Procedure

All participants accessed the study through a web address. There were no restrictions on when participants could access the study and it was possible for multiple participants to take part at any one time. At each stage of the study participants were able to click a 'withdraw' button which would automatically fast-track them to the debrief statement at the end of the study and their data would not be uploaded to the secure database.

Participants first read the information sheet (see Appendix G) and were asked to consent to taking part in the study (see Appendix H). Participants checked a box if they agreed to the following three questions: 1) I have read and understood the information describing the study; 2) I am aged between 18 and 65 years old and freely consent to participate; and 3) I understand that I am free to withdraw from the study at any time. If they did not respond in the affirmative they were unable to proceed with the study. Participants were then presented with a short description of each measure and asked to complete them in turn. Firstly participants provided a number of socio-demographic details, followed by the completion of the PVQ-R and the PS.

The next screen presented detailed PDG instructions as used in Ellett et al. (2013). Of note, participants were told they would be playing between one and six rounds of the PDG. In reality, all participants played only one round. This minor deception was utilised as in previous research (e.g., Ellett et al., 2013) to avoid the restriction of range seen in research studies as a result of an increase in competition if participants know they are only completing a single round (Axelrod, 1984; Pruitt & Kimmel, 1977). Specifically, this increase in competition exists because in a one-round game, each side maximizes its outcomes by competing regardless of whether the other side cooperates or competes (Wildschut, Lodewijkx, & Insko, 2001). Similarly, participants were informed they were playing the PDG against another player online. In reality they were playing the computer (i.e., the online programme had been pre-programmed). Participants were informed that the amount of credits they would earn would be determined by their own PDG choice as well as the PDG choice of the other player. The decision matrix was given (as shown in Figure 2.1) with an explicit step-by-step description of each possible combination and the amount of credits earned in each. On the following page, to ensure full comprehension of the PDG matrix, participants were asked to provide the amount of credits won in four matrix scenarios. They could only proceed if they provided correct answers (Wildschut et al., 2002). On the following screen participants see the words 'searching for other participant' flash for 30 seconds. Whilst they are ostensibly waiting for another player to be found the decision matrix and the four scenarios from the previous screen with the correct credit outcomes are provided as a refresher. After the 30 seconds has elapsed 'we have located another player' appears on the screen. Automatically they are taken to the next screen which allows them to make their PDG choice whilst the matrix is provided for the final time as an aide-mémoire. The words 'your selection is being confirmed' flash on the

screen for seven seconds immediately following their PDG choice. It is then replaced by the words 'whilst we are waiting for your opponent's choice please answer the following questions' and the screen automatically moves to present the SPS with brief instructions. The final questionnaire, the measure of choice reasons, is then presented.

Participants were then informed of their opponents' choice (which is always that they cooperated) and that they had reached the end of the game. The following screen provided a full debriefing statement (see Appendix I) highlighting the small amounts of minor deception utilised and reiterating the sources of support available should participants feel worse for having taken part in the study. Participants were asked to consent to their data being used in the study now that a full understanding was held, thus allowing them another opportunity to withdraw if they wished to do so. Finally, to receive their iTunes voucher for taking part, participants were asked to email the experimenter, and were informed that they have earned a 99p iTunes song which would be 'gifted' to them after they provided two potential song choices.

2.9 Ethical Considerations

Full ethical approval was obtained from the Royal Holloway Ethics committee prior to the commencement of data collection (reference 2013/006). See Appendix J for a copy of the approval. The British Psychological Society (BPS) have published a number of guidelines that pertain to ethical considerations relevant to this research. These include the *Code of Human Research Ethics* (BPS, 2011) applicable to all research using humans and a recent adjunct, *Ethics Guidelines for Internet Mediated Research* (IMR; BPS, 2013) which highlights how special consideration may be needed to certain principles in an IMR context. Additionally, *Conducting Research on the Internet* (BPS,

2007) was consulted for the current research in its capacity to provide more general guidance for all online psychological research, as well as adhering to the principles outlined in the BPS's *Supplementary Guidance on the use of Social Media* (BPS, 2012) as the current study utilised recruitment through social media as one method of reaching potential participants.

Issues of informed consent, withdrawal, debrief and deception were adhered to in this study. More specifically, to ensure that consent was truly as 'informed' as possible, a tick box option was put in place to confirm that participants had read and understood the information. Until this was checked participants were not able to progress. The online programme was designed to have the ability for participants to intentionally skip questions should they wish to do so whilst reducing unintentionally missed questions with the use of confirmatory pop-up windows. The online programme also had the functionality to allow participants to withdraw at any point. In terms of debrief, the debrief page was fully comprehensive and was provided on completion of the study, but also if participants chose to withdraw at any point before the end of the study. Lastly, when considering deception, the study design purposely uses deception in that participants will only complete one game of the PDG but are told it may be between one and six rounds, and in thinking they were playing a real person. However, as discussed previously, this is necessary to ensure the validity of the research. This level of deception is minor, and was not anticipated to cause any psychological or emotionally negative effects. However, the debrief page signposted participants to their local counselling service (for RHUL university students), their GP and the Samaritans.

RESULTS

3.1 Overview of Chapter

The results chapter begins with a data analysis section which outlines the main statistical methods used for each hypothesis as well as general conventions adhered to throughout. This is followed by a data screening section which describes procedures undertaken for preparing the data before the relevant statistical analyses were carried out. Details are provided regarding the process of examining the normality of distributions, including any transformations undertaken for non-normal distributions, and the steps taken to deal with missing data, outliers and extreme scores. The socio-demographic characteristics of the sample are then presented. Finally, each of the four research areas with associated hypotheses are outlined and their corresponding statistical analyses are reported.

3.2 Data Analysis

The data for the current study were analyzed using the Statistical Package for Social Sciences version 21.0 (SPSS; version 21.0). For data interpretation, exact p-values are given, unless otherwise stated. Findings are reported to two decimal places with the exception of percentages which are reported to one decimal place, and mediation and moderation analysis which are reported to three decimal places. All hypothesis testing was two-tailed. Where Levine's Test for Equality of Variances was found to be significant, t-values where equal variances were not assumed were reported. For correlational analyses with multiple comparisons, Bonferroni corrections were applied to redress the inflated Type I error (incorrect rejection of a true null hypothesis).

To address the hypothesis that forms Research Area 1 concerning the relationships between values and paranoia, Pearson's Product Moment Correlation coefficients were calculated for trait paranoia (PS scores) and the 19 basic human values (PVQ-R). This hypothesis was part *a priori* as determined by empirical and theoretical considerations provided earlier, and part exploratory because research into associations between paranoia and values is novel. For this reason all 19 basic values were used in the correlational analysis with the Bonferroni correction.

To address the hypotheses that form Research Area 2 concerning paranoia and the PDG, a dichotomous variable was created where '0' was coded as cooperation on the PDG and '1' was coded at competing on the PDG. The categorical nature of the PDG variable meant point-biserial correlation coefficients were calculated to investigate the associations between paranoia (trait and state) and PDG choice (compete or cooperate), as well as to greed and distrust motives (choice reasons assessment). Mediation analysis was used to further investigate distrust-based competition on the PDG. The present research utilizes increasingly widespread approaches which reject the prerequisite that mediation analysis can only be undertaken if one can successfully demonstrate an association between the predictor variable (X) and the outcome variable (Y) (e.g., Hayes, 2009; MacKinnon, 2008; Zhao, Lynch & Chen, 2010). These new approaches are now in favour over traditional models of mediation, namely Baron and Kenny's (1986) causal steps model. Subsequently, mediation analysis is conducted with Hayes' (2013) PROCESS tool as an adjunct to SPSS. Bias-corrected bootstrap confidence intervals (1,000 samples) are used as the inferential approach for the indirect effects (MacKinnon, Lockwood, & Williams, 2004; Preacher & Hayes, 2008). Bootstrapping is a resampling method that offers an increasingly utilized alternative to

normal theory approach which benefits from making no assumptions about the shape of the sampling distribution (Hayes, 2013). Bootstrapping generates an empirically derived representation of the sampling distribution of the indirect effect by sampling n cases from the original sample ($N = 221$) and resampling observations with replacement to produce an estimate of the summary statistic. To address the hypothesis in Research Area 3 concerning values and PDG choice, point-biserial correlation coefficients were calculated.

Lastly, to address the hypotheses in Research Area 4 concerning paranoia, values and the PDG, mediation analysis as described previously was used. In addition, the presence of statistical interaction effects were investigated using multiple regressions to explore the association between values (namely, power and security) and PDG choice as potentially varying depending upon paranoia levels. For moderation analysis, all paranoia and value scores were centered by subtracting the mean from each variable to leave deviation scores before being entered into the regression models following Aiken & West (1991) and as recommended in this form of analysis (Hayes, 2013; Tabachnick & Fidell, 2001). Regression models were used to identify interaction effects, and where significant, Preacher, Curran and Bauer's (2006) online interaction tool was used to further decompose the relationship between predictor and outcome variables. For this hypothesis, composites were calculated for power and security by averaging the scores across the two power values (dominance and resources) and two security values (personal and security) (Schwartz et al., 2013).

3.2.1 Data Screening

Prior to carrying out any statistical analysis, descriptive statistics were explored which confirmed that all observed data were within expected ranges. The data set was screened for missing data, of which there were no missing values ($N = 221$). Screening for outliers was undertaken next, and a screen to ensure that all the assumptions for the use of parametric analyses were met (Tabachnick & Fidell, 2001).

In accordance with the aim of the study to investigate paranoia in the nonclinical population, independent *t*-tests and a Chi-Square were conducted to ascertain if responses to the relevant independent variables differed depending on whether participants indicated previous personal contact with mental health services or not. There were no differences found between participants who had indicated having previous personal contact with mental health services and those who had not for our relevant paranoia measures of PDG choice ($\chi^2(1) = .95$, $p = .329$), PS scores ($F = 1.55$, $p = .22$), or SPS scores ($F = .55$, $p = .46$). Therefore, previous contact with mental health services was not used as an exclusion criteria. All participant data were retained.

3.2.2 Outliers

Outliers were investigated by observing the frequency outputs and generating boxplots for all measures. An outlier was defined as an extreme score if the data point was more than three standard deviations from the mean of the variable of interest (Field, 2009). Within the paranoia measures two outliers were identified in the PS and eleven outliers were identified in the SPS of which four were extreme scores. Tabachnick & Fidell (2001) suggest that for univariate outliers a first option for reducing impact is variable

transformation, undertaken to change the shape of the distribution to more nearly normal. This methodology was applied when numerical operators indicated significant z-scores for skew and kurtosis, as was the case for the PS. Where numerical indicators suggest datasets were normally distributed, as with the SPS, extreme scores were retained in the dataset. This prevented a loss of power and because the sample is large in the present study, the chance that the extreme SPS scores would have a disproportionate influence is lowered (Field, 2009; Tabachnick & Fidell, 2001).

3.2.3 Parametric Data Assumptions

The distributions of the PS, SPS, and for the entire sample ($N = 221$) were checked for normality by inspecting their histograms with normal curves and calculating skewness and kurtosis z-scores using the following formulae:

$$Z_{skewness} = \frac{S - 0}{SE_{skewness}} \qquad Z_{kurtosis} = \sqrt{\frac{K - 0}{SE_{kurtosis}}}$$

A distribution was considered normal if a z-score for both skewness and kurtosis was less than 2.58 ($p < .01$) (Field, 2009). The PS was significantly positively skewed ($z = 4.36, p < .01$). A square root transformation was applied (Tabachnick & Fidell, 2001) which resulted in a normal distribution with acceptable levels of skew ($z = 2.34, p > .01$) and kurtosis ($z = .70, p > .01$). The SPS had acceptable levels of skew ($z = -2.53, p > .01$) and kurtosis ($z = 2.44, p > .01$).

3.3 Socio-Demographic Characteristics of the Sample

The socio-demographic characteristics for the entire sample are presented in Table 3.1.

Table 3.1. *Socio-demographic characteristics of the sample*

	Total *N* = 221
Gender N (*%*)	
Male	92 (41.6)
Female	129 (58.4)
Age in years	
Mean	23.23
Standard deviation	6.79
Employment status N (*%*)	
Employed	36 (16.3)
Full-time education	176 (79.6)
Unemployed	9 (4.1)
Education status N (*%*)	
O-levels/GCSE or equivalent	46 (20.8)
A-levels or equivalent	145 (65.6)
Degree or equivalent	28 (12.7)
Post-graduate qualification or equivalent	2 (.9)
Ethnic/cultural group N (*%*)	
White British	146 (66.1)
Any other white background	27 (12.2)

Asian	33 (14.9)
Any other black background	1 (.5)
Mixed white British and other	9 (4.1)
Mixed white non-British and other	2 (.9)
Any other mixed background	3 (1.4)
Religion N (%)	
Christian	74 (33.5)
Buddhist	1 (.5)
Hindu	4 (1.8)
Muslim	11 (5.0)
Jewish	1 (.5)
Other	7 (3.2)
None	122 (55.2)
Marital status N (%)	
Single	186 (84.2)
Married or cohabiting	35 (15.8)
Number of children N (%)	
0	206 (93.2)
1	8 (3.6)
2	5 (2.3)
3	1 (.5)
4	0(0)
5	1 (.5)

3.4 Statistical Analyses of the Hypotheses

3.4.1   Research Area 1: Paranoia and Values

Pearson's product-moment correlations were calculated between trait paranoia and the 19 value priorities of the PVQ-R (see Table 3.2). To protect against family-wise error, a Bonferroni corrected alpha level of 0.003 (i.e., 0.05/19) was employed.

Table 3.2. *Correlation matrix for trait paranoia (PS scores) and PVQ-R value priorities*

	Trait Paranoia	
Values	**Pearson's *r***	***p*-value**
SDT: Self-direction-thought	-0.06	.36
SDA: Self-direction-action	-0.02	.78
ST: Stimulation	0.04	.52
HE: Hedonism	-0.13	.05
AC: Achievement	0.11	.11
POD: Power-dominance	0.14	.04
POR: Power-resources	0.19	.01
FAC: Face	0.34	<.001*
SEP: Security-personal	-0.01	.93
SES: Security-societal	0.02	.77
TR: Tradition	-0.01	.89
COR: Conformity-rules	-0.05	.43
COI: Conformity-interpersonal	-0.00	.97
HU: Humility	-0.13	.06

BED: Benevolence-dependability	-0.00	.96
BEC: Benevolence-caring	-0.14	.03
UNC: Universalism-concern	-0.12	.09
UNN: Universalism-nature	-0.06	.34
UNT: Universalism-tolerance	-0.23	<.001*

*Note. *p<.003*

The observed Pearson's correlations between trait paranoia and the importance attributed to each value type are shown graphically in Figure 3.3.
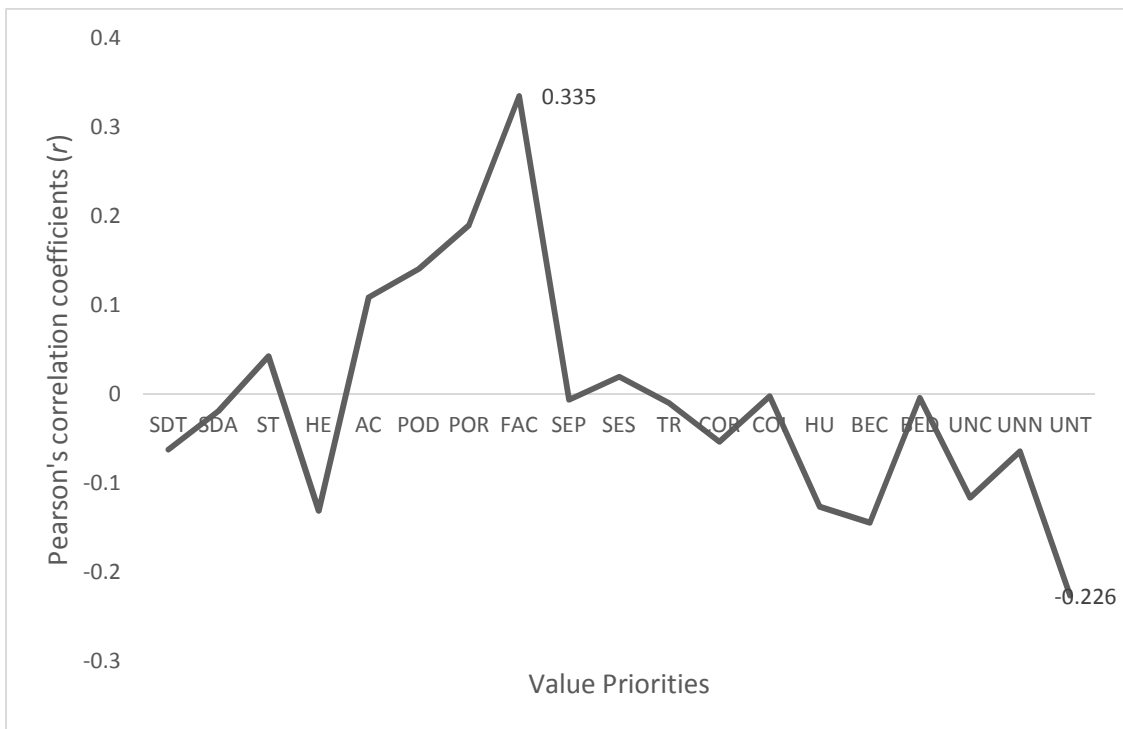

Figure 3.3. Pearson's correlations of value priorities and trait paranoia

Note. Pearson's *r* are provided for statistically significant correlations (*p* < .003)

Hypothesis 1) The values of power, security, benevolence and universalism will be associated with trait paranoia.

A statistically significant correlation was found between trait paranoia and valuing face. Correlations were significant for trait paranoia and valuing power-dominance and power-resources but these associations did not reach statistical significant after the Bonferroni correction was applied. No significant correlation was found between trait paranoia and valuing security (personal or societal).

A statistically significant negative correlation was found between trait paranoia and valuing universalism-tolerance. The association between trait paranoia and benevolence-caring was significant but did not reach statistical significance after the Bonferroni correction was applied. No further significant correlations were found between trait paranoia and valuing the additional universalism values (concern and nature) nor for the other benevolence value (dependability). Additionally, the association between trait paranoia and 'hedonism' was significant but did not reach statistical significance after the Bonferroni correction was applied.

These findings indicate that Hypothesis 1 was partially supported.

3.4.2 Research Area 2: Paranoia and the PDG

Among the total sample, 109 participants chose to cooperate and 112 choose to compete on the PDG. Descriptive statistics for trait and state paranoia for the entire sample and based on the decision to either compete or cooperate on the PDG are presented in Table 3.4.

Table 3.4: *Descriptive statistics for trait and state paranoia for the entire sample and by PDG choice*

	Compete N=112	Cooperate N=109	Total N=221
Paranoia Scale (PS)			
Mean	40.16	39.74	39.96
Standard deviation	1.18	0.98	1.08
Range	20-86	20-88	20-88
State Paranoia Scale (SPS)			
Mean	14.98	14.37	14.68
Standard deviation	2.97	2.81	2.90
Range	5-25	6-24	5-25

Hypothesis 2a) Trait and state paranoia will be associated with the behavioural choice to compete on the PDG.

Because PDG choice is a dichotomous variable, point-biserial correlations (r_{pb}) were calculated. The point-biserial correlation coefficient between competition on the PDG with both trait paranoia (r_{pb} (219) = .016, p = .81) and state paranoia (r_{pb} (219) = .106, p = .12) was not significant. This finding indicates that Hypothesis 2a was not supported.

Hypothesis 2b) Trait and state paranoia will be positively associated with distrust motives but not greed motives on the PDG.

Descriptive statistics for state paranoia, trait paranoia and scores for total-distrust and total-greed are detailed in Table 3.5.

Table 3.5. *Descriptive statistics for state paranoia (SPS), trait paranoia (PS), distrust and greed total scores*

	Mean	SD	Range
State Paranoia Scale (SPS)	14.68	2.90	5 - 25
Paranoia Scale (PS)	39.00	13.58	20 - 88
Distrust Score	3.51	1.64	1 – 6
Greed Score	3.35	1.9	1 - 7

As predicted there was a significant positive relationship between distrust and trait paranoia ($r(219) = .210$, $p = .002$) and a non-significant relationship for greed and trait paranoia ($r(219) = .085$, $p = .210$). Higher trait paranoia is associated with higher distrust and is not associated with greed. As predicted there was a significant positive relationship between distrust and state paranoia ($r(219) = .182$, $p = .007$), such that higher distrust was associated with higher state paranoia. There was also a significant positive relationship between state paranoia and greed ($r(219) = .179$, $p = .007$) indicating that higher greed is also associated with higher state paranoia. These findings partially support Hypothesis 2b.

Hypothesis 2c) Distrust will mediate the effect of trait paranoia on the behavioural

choice to compete on the PDG.

The INDIRECT procedure for SPSS (Peacher & Hayes, 2008) was used to derive

total, direct, and indirect effects of trait paranoia on PDG choice through distrust

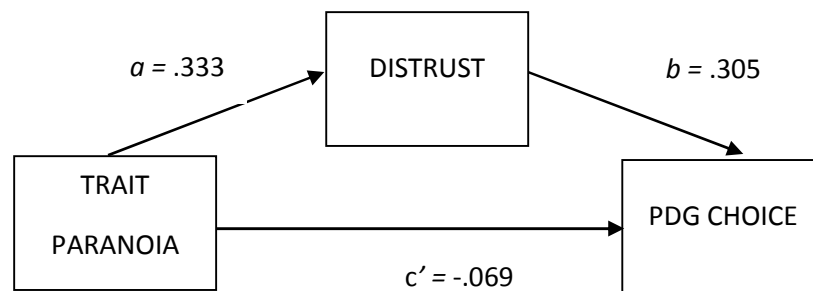using the model in Figure 3.6. Coefficients for the model can be seen in Table 3.7.

Figure 3.6. Simple mediation model for trait paranoia on PDG choice via distrust

Note. Regression coefficients are superimposed on the statistical diagram

Table 3.7. *Mediation model coefficients for trait paranoia on PDG choice via distrust*

		Consequent						
		M (DISTRUST)				**Y (PDG DECISION)**		
Antecedent		**Coeff.**	**SE**	***p***		**Coeff.**	**SE**	***p***
X(TRAIT PARANOIA	a	.333	.105	.002	c'	-.068	.137	.616
M(DISTRUST)		___	___	___	b	.305	.090	<.001
Constant	i_1	1.404	.670	.037	i_2	-.607	.866	.483
		$R^2 = .044$						
		$F(1,219) = 10.128, p = .002$						

Note. Where SE = Standard Error, i_1 and i_2 = regression intercepts

The direct effect of trait paranoia on PDG choice was estimated by regressing PDG choice onto trait paranoia to produce path c' (see Figure 3.6). A binary logistic regression was used because PDG choice was dichotomous. The direct effect of trait paranoia on PDG choice when distrust is held constant ($c' = -.069$) is not statistically significant ($Z = -.502$, $p = .616$). This non-significant relationship replicates the non-significant relationship between these variables in Hypothesis 2a using a point-biserial correlation. The total effects of trait paranoia on PDG choice ($c = .031$) is not statistically significant ($Z = .239$, $p = .811$).

More pertinent to the mediation hypothesis was the estimate of the indirect effect of trait paranoia on PDG choice. This is quantified as the product of the regression coefficient estimating distrust from trait paranoia (path a in Figure 3.6) and the logistic regression coefficient estimating PDG choice from distrust controlling for trait paranoia (path b in Figure 3.6). The indirect effect of trait paranoia on PDG choice mediated by distrust ($ab = .333(.305) = .102$) is statistically significant (95% bias-corrected bootstrapping confidence interval from .036 to .232).

The mediation analysis shows that the effect of trait paranoia on PDG choice to compete operates indirectly through distrust. Higher trait paranoia translates to a higher PDG choice (i.e., towards the decision to compete, where 1=compete and 0=cooperate) as a result of a tendency for those who are more paranoid to feel more distrust. The findings suggest that Hypothesis 2c was supported.

3.4.3   Research Area 3: Values and the PDG

Point-biserial correlations were calculated between PDG choice and the value priorities of power, security, benevolence and universalism (see Table 3.8). The value of face was also included as it sits between power and security in Schwartz et al.'s (2013) basic values theory as a consequence of being defined by aspects of both power and security. To protect against family-wise error, a Bonferroni corrected alpha level of 0.005 (i.e., 0.05/10) was employed.

Hypothesis 3) The values of power, security, benevolence and universalism will be associated with the behavioural choice on the PDG.

Significant positive correlations were found for PDG choice and valuing power-dominance and power-resources, such that, when power is a high value priority for a participant they are more likely to compete on the PDG. The relationship between PDG choice and valuing face and security (personal and societal) were not significant. No statistically significant correlations were found for PDG choice and valuing any of the benevolence or universalism values. The findings suggest that Hypothesis 3 was partially supported.

Table 3.8. *Correlation matrix for PDG choice and PVQ-R value priorities for power, security, face, benevolence and universalism.*

Values	PDG Choice (0 = *cooperate*, 1 = *compete*)	
	Point-biserial coefficient r_{PB}	*p*-value
POD: Power-dominance	0.19	<.001*
POR: Power-resources	0.19	<.001*
FAC: Face	0.01	.92
SEP: Security-personal	0.01	.89
SES: Security-societal	-0.09	.18
BED: Benevolence-dependability	-0.08	.22
BEC: Benevolence-caring	-0.02	.76
UNC: Universalism-concern	-0.07	.32
UNN: Universalism-nature	-0.00	.96
UNT: Universalism-tolerance	-0.12	.09

*Note. * p < .005*

3.4.4   Research Area 4: Paranoia, Values and the PDG

Hypothesis 4a) Valuing power or security will predict PDG competition when moderated by trait paranoia.

A series of logistic regression analyses were carried out in order to investigate whether the association between values (namely, valuing security or power) and PDG choice (cooperate or compete) depended on the individual's level of trait paranoia. Logistic regression analysis was used because the PDG choice (the dependent

variable) is categorical (i.e., compete or cooperate). Of interest for each regression model tested, was whether the interaction effect (value*trait paranoia) was significant which would indicate further probing of the interaction using simple slopes analysis to visually plot the effects (Hayes, 2013).

The interaction effects between trait paranoia and valuing power for power-dominance (b = -.075, SE_b = .101, β = .928, p = .461) and power-resources (b = .047, SE_b = .106, β = 1.049, p = .654) were not significant. Similarly, the interaction effects between trait paranoia and valuing security for security-personal (b = .073, SE_b = .135, β = 1.076, p = .585) and security-societal (b = .106, SE_b = .129, β = 1.112, p = .409) were not significant. Because of non-significant results for the values that create the composites of power and security, logistic regression models were not tested for composite scores. No interactions were significant so no further exploration of the data was warranted. These findings suggest that Hypothesis 4a was not supported.

Hypothesis 4b) Valuing power and security will mediate the effect of trait paranoia on PDG choice.

The INDIRECT procedure for SPSS (Preacher & Hayes, 2008) was used to explore a simple mediation model for the total, direct and indirect effects of trait paranoia on PDG choice through valuing security. The direct effect of trait paranoia on PDG choice when security was held constant (c' = .037) is not statistically significant (Z = .285, p = .776). The total effects of trait paranoia on PDG choice (c = .031) is not statistically significant (Z = .239, p = .811). Similarly, the indirect effect of trait paranoia as mediated through security (*ab* = .138(-.048) = .007) was also not

significant (95% bias-corrected bootstrapping confidence interval from -.064 to .041) as the indirect effect straddles zero.

The INDIRECT procedure for SPSS (Peacher & Hayes, 2008) was used to derive total, direct, and indirect effects of trait paranoia on PDG choice through valuing power using the model in Figure 3.9. Coefficients for the model can be seen in Table 3.10.
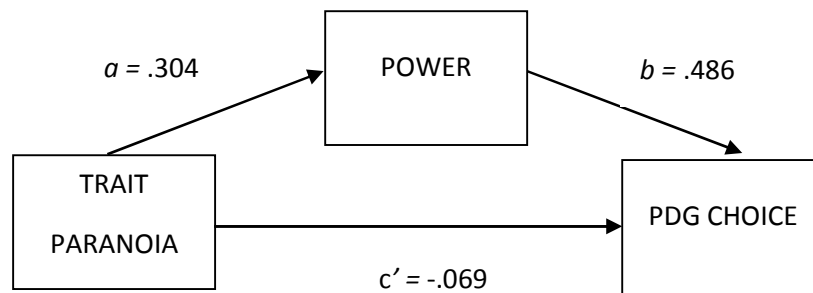

Figure 3.9. Simple mediation model for trait paranoia on PDG choice via power

Note. Regression coefficients are superimposed on the statistical diagram

The direct effect of trait paranoia on PDG choice was estimated by regressing PDG choice onto trait paranoia to produce path *c'* (see Figure 3.9). A binary logistic regression was used because PDG choice was dichotomous. The direct effect of trait paranoia on PDG choice when power is held constant (c' = -.069) is not statistically significant (Z = -.502, p = .616). The total effects of trait paranoia on PDG choice (*c* = .0311) is not statistically significant (Z = .239, p = .811).

More pertinent to the mediation hypothesis was the estimate of the indirect effect of trait paranoia on PDG choice. This is quantified as the product of the regression coefficient estimating power from trait paranoia (path *a* in Figure 3.9) and

the logistic regression coefficient estimating PDG choice from power controlling for trait paranoia (path b in Figure 3.9). The indirect effect of trait paranoia on PDG choice mediated by power ($ab = .304(.486) = .148$) is statistically significant (95% bias-corrected bootstrapping confidence interval from .064 to .288).

The mediation analysis shows that the effect of trait paranoia on PDG choice to compete operates indirectly through power. Higher trait paranoia translates to a higher PDG choice (i.e., towards the decision to compete, where 1=compete and 0=cooperate) as a result of a tendency for those who are more paranoid to value power more highly. The findings suggest that Hypothesis 4b was partially supported.

Table 3.10. *Mediation model coefficients for trait paranoia on PDG choice via power*

			Consequent					
		M (POWER)				*Y* (PDG DECISION)		
Antecedent		Coeff.	SE	*p*		Coeff.	SE	*p*
X(TRAIT PARANOIA)	a	.304	.063	<.001	c'	-.114	.141	.420
M(POWER)		___	___	___	b	.486	.149	.001
Constant	i_1	.925	.406	.024	i_2	-.170	.833	.839

$$R^2 = .095$$

$$F(1,219) = 22.903, p < .001$$

Note. Where *SE* = Standard Error, i_1 and i_2 = regression intercepts

DISCUSSION

4.1 Overview

The aims of the study were: (1) to examine relationships between paranoia in the nonclinical population and human values; (2) to replicate the finding of Ellett et al. (2013) that distrust-based competition on the PDG is a behavioural marker for nonclinical paranoia; (3) to extend the research of Ellett et al. (2013) by looking to the social psychology literature on human values as additional potential motivations for competition in the PDG; and (4) to combine the three areas of nonclinical paranoia, human values and the PDG together to further explore any potential complex interactions.

This chapter will begin by discussing the study's main findings separated into four sections based upon the key findings. These sections are: (1) paranoia and values; (2) paranoia and the PDG; (3) values and the PDG and (4) paranoia, values and the PDG combined. The findings are discussed in relation to relevant existing theory and empirical research, and incorporate suggestions for future research. Potential clinical implications of the research will then be outlined, followed by a discussion of the study's strengths and limitations, and finishing with concluding remarks.

4.2 Main Findings

4.2.1 Paranoia and Values

No previous research has directly examined associations between nonclinical paranoia and human values despite the conceptual overlap between the role of values in forming

attitudes and beliefs to guide behaviour, and the role of beliefs about the self, world and others as central components in the formation of persecutory delusions across the paranoia continuum (Freeman & Freeman, 2008; Freeman, Garety, Bebbington, Smith et al., 2005; Freeman et al., 2002).

Notwithstanding this lack of research, there are empirical and theoretical grounds for expecting specific values to be associated with paranoia. For example, when considering the research of Schwartz (1996) and Ellett et al. (2013) there exists empirical support to suggest that the value of power will be associated with paranoia. On theoretical grounds when considering the threat based nature of paranoia (Freeman, et al., 2002; Freeman & Garety, 2000; Freeman, 2007; Freeman & Freeman, 2008) the value of security is hypothesized to be more likely to be associated with paranoia.

Interestingly, higher trait paranoia was not directly associated with the values of security (personal or societal) nor power (resources or dominance) individually, but rather with face, a novel value in Schwartz et al's (2012) refined human values theory which expresses elements of both power and security. Individuals who value face, value maintaining and protecting their prestige. Exploiting one's prestige enables people to control others and command resources. It also enables one to defend against the threats to one's security inherent in attacks on one's public image which allows us to avoid humiliation (Schwartz et al., 2012). Interestingly then, higher trait paranoia is associated with both power and security values as was predicted, but this association was through the combination of security and power values as subsumed in valuing face, rather than a direct association to each value *per se*.

The association between higher trait paranoia and a commitment to maintaining one's public image is consistent with research in the nonclinical population that

suggests that conditions of high self-awareness are associated with higher trait paranoia in experimental settings (Ellett & Chadwick, 2007). The motivational goals of protecting one's image and defending against humiliation as subsumed by a commitment to the value of face also have overlap with clinical models of persecutory delusions. Bentall and colleagues (Bentall, Kinderman & Kaney, 1994; Bentall et al., 2001) suggest that persecutory delusions are formed as a result of ineffective efforts to minimise the threat to self-esteem from discrepancies between how one would ideally like to be perceived versus how they actually perceive themselves. In light of the value placed on nonclinical paranoia to inform our understanding of clinical paranoia (e.g., Freeman, Garety, Bebbington, Smith et al., 2005) this conceptual overlap between the value of face in nonclinical paranoia and the role of self-esteem as a defence against clinical paranoia is offered as an interesting finding. It is however, also offered tentatively, due to a lack of current clarity in the literature regarding the exact nature of the association between clinical and nonclinical manifestations of paranoia (e.g., Bebbington et al., 2013).

In light of the circular structure inherent in values theory we predicted that values in opposition to power and security, namely benevolence and universalism, would be most negatively associated with trait paranoia. Consistent with prediction, the current research found a strong negative association between valuing universalism-tolerance and lower trait paranoia. This suggests that individuals who value universalism-tolerance (i.e., they have an acceptance and understanding of those who are different from oneself; Schwartz et al., 2012) report lower trait paranoia. This fits with current conceptualisations of paranoia. Paranoia relates to mistrust and suspicion (Freeman et al., 2011) and is interpersonal in nature (Ellett et al., 2013). Theoretical

accounts of persecutory delusions assert a role for assuming the other to be threatening and hostile (Freeman et al., 2002; Freeman & Garety, 2003; Freeman, Garety, Bebbington, Smith et al., 2005; Green & Philips, 2004; Turkat, Keane & Thompson-Pope, 1990). Indeed, within a nonclinical sample of college students, Combs, Penn, Wicher, & Waldheter (2007) demonstrated that a greater hostility bias in ambiguous situations is significantly associated with higher trait paranoia. Therefore, if paranoia is low, there would be no perception of the 'other' as having any form of threat toward the self, thus when threat is low, we are able to be more accepting and tolerant of others, consistent with the present finding of low paranoia being associated with valuing universalism-tolerance.

Consistent with prediction the present study also found a significant correlation with valuing benevolence and lower trait paranoia at a 95% confidence level ($p = .03$). However, the application of a Bonferroni correction to protect against family-wise error rate due to multiple comparisons took this coefficient outside of significance ($p = .003$). There is a movement in the literature (e.g., Perneger, 1998) which cautions against the use of Bonferroni corrections because the interpretation of a finding depends on the number of other tests performed. Perneger (1998) also warns that the adjustment increases the likelihood of Type II errors such that truly important differences are deemed non-significant. The present study offers this tentatively as one explanation for why no statistically significant result of valuing benevolence and lower trait paranoia was found.

The pattern of association between the 19 values provides further support for the circular structure of Schwartz et al.'s (2012) value theory. In addition, it has done so in relation to nonclinical paranoia, not previously investigated together within the

literature before. The motivational continuum of values predicts that any phenomenon will be associated with each value in a determined way with associations becoming weaker as you move around the values circular structure (see Introduction, section 1.8.2, page 41). Using correlational analysis, typically one value will be most strongly correlated to any phenomenon. This is then followed in strength of association by values adjacent to it on the circular structure, and most negatively associated to values directly opposed to it on the circular structure. Values orthogonal (at right angles) to the most strongly associated value are not predicted to be associated and will have near zero-order correlations. Unfolding the values structure for the association with trait paranoia yields this integrated prediction of values and paranoia correlations. Graphically this pattern of association reveals the predicted sinusoidal 'wave' shape in the current study (see Results, Section 3.4.1, page 71), as seen in previous studies using Schwartz's value theory (e.g., Schwartz, 1996). In the present study, the value of face was most associated with higher paranoia and valuing universalism-tolerance most associated with lower trait paranoia with the additional 17 values forming a relatively smooth sinusoidal shape between these anchoring values.

Future research could look to explore the relationship between values and paranoia further by investigating the values held by people with clinical persecutory delusions. Do the associations between valuing face and universalism-tolerance hold for clinical paranoia? Additionally, the associations between values and paranoia could be explored with dimensional measures of paranoia such as Paranoia Checklist (PC; Freeman, Garety, Bebbington, Smith et al., 2005) which measures frequency, degree of conviction and level of distress, or the Green et al. Paranoid Thoughts Scale (GPTS; Green et al., 2008) which assesses the dimensions of preoccupation, conviction and

distress. The GPTS can be used in clinical and nonclinical groups (e.g., Green et al., 2008) thereby allowing a measurement of change in how the dimensions of paranoia might be differentially associated with values, but also how these associations might change as one moves through the continuum from nonclinical to clinical paranoia. It might also be interesting to examine whether individual value priorities differ according to whether an individual's persecutory belief is classified as Poor Me paranoia (i.e. harm is undeserved), or Bad Me paranoia (i.e. harm is deserved) (Trower & Chadwick, 1995).

In summary, the present study sought to integrate a body of knowledge on human values which exists within social psychology with clinically driven perspectives on paranoia. It suggests that nonclinical paranoia is associated with face values and least associated with universalism-tolerance. These initial findings would benefit from replication to attest to their reliability and validity. Future research may look to establish the relationships between values and paranoia across time in longitudinal research to improve upon the ability to make causal statements from cross-sectional research. The overlap in constructs between values and self-esteem also tentatively suggest the potential role that values may have in clinical samples.

4.2.2 Paranoia and the PDG

The hypotheses relating to paranoia and the PDG were derived from the research of Ellett et al. (2013) who argued that distrust-based competition in the PDG is a behavioural marker of nonclinical paranoia. The present study sought to establish if this finding could be replicated to further support its use as a novel behavioural adjunct to

self-report measures. Initial analysis sought to establish an association between PDG choice (cooperate vs. compete) and paranoia (trait and state). No significant association was found between state or trait paranoia and behavioural choice on the PDG. It is important to consider possible explanations for this null finding, particularly as the present study employed a large sample with good power to detect an effect (i.e., avoiding a Type II error). Two possibilities are considered.

The first possible explanation relates to the null association between state paranoia and PDG choice by considering the distribution of scores on the SPS. The present study found comparable SPS means and standard deviations for PDG cooperation and competition to that of Ellett et al. (2013). However, modal data for the present study indicated that 51% (n = 112) of the entire sample choose the median option which equates to a noncommittal 'unsure' response. The SPS did have acceptable levels of skew (z = -2.53, p >.01) and kurtosis (z = 2.44, p >.01) but were at the ceiling for this definition (acceptable skew and kurtosis when z scores are < 2.58 at p < .01; Field, 2009). Data showed a tendency to skew to the lower end of the distribution. Indeed, the cumulative percentage of respondents who answered 16 and below was 91%, with only 8% of the participants reporting the higher scores of 17-20. This may have limited the variation in responses, which is turn limits the availability of finding an effect. In light of the null results for state paranoia and PDG competition, future research could helpfully explore this further by manipulating the likelihood of participants experiencing state paranoia in the PDG paradigm. The camera paradigm used by Ellett and Chadwick (2007) could be employed to study how changes in state paranoia impact on distrust-based PDG competition.

The second explanation relates to the null association between trait paranoia and PDG choice. Although this result is surprising, the actual core of the PDG as a behavioural marker for nonclinical paranoia relates to the *motives* with which participants compete (i.e., distrust-based competition), not solely just that participants compete. Distrust is a central component of paranoia (Ellett et al., 2013). In the PDG, Ellett et al. (2013) reason that competition is used as a defence against the view that the opponent possesses malevolent intentions. In line with this, and replicating what Ellett et al. (2013) found, the present research found that higher distrust was associated with higher state and trait paranoia. A secondary component to the hypothesis was that paranoia would not be associated with greed based competition because this relates to desires to exploit the other for material gain, and is therefore not conceptually related to paranoia. In support of this, no association was found between trait paranoia and greed. There was however a significant relationship between state paranoia and greed which was not predicted. As discussed previously this effect may be a consequence of the distribution of SPS scores. Replication of these findings with a greater spread (and therefore greater variation) of scores for state paranoia within the PDG using the SPS would be helpful to clarify if the result was valid or can be explained by idiosyncratic data.

The mediation analysis provides additional support for the role of distrust-based competition in the PDG. The analysis showed that the effect of trait paranoia on PDG competition operates indirectly through distrust. No direct effect was found for trait paranoia and PDG choice. This null association was previously reported in Hypothesis 2a. An important statistical point to address here is the progression to mediation when the direct effect is not significant. Contrary to traditional mediation methodologies

(e.g., Baron & Kenny, 1986), more modern mediation analysis no longer imposes evidence of simple association between X (trait paranoia) and Y (PDG choice) as a precondition for mediation (e.g., Hayes, 2009; Hayes, 2013; Hayes & Preacher, 2013; MacKinnon, 2008). Consequently the mediation is valid, and the results showed a significant indirect effect of trait paranoia on PDG choice via distrust. Specifically, higher trait paranoia translates to a higher PDG choice (i.e., towards the decision to compete, where 1=compete and 0=cooperate) as a result of a tendency for those who are more paranoid to feel more distrust. The findings offer support for the use of distrust-based competition on the PDG as a marker for nonclinical paranoia, and demonstrates the importance of a fuller understanding of the construct of distrust and how it relates to paranoia.

The construct of distrust is intrinsic within the PDG and levels of trust have been shown to influence game choice (Insko et al., 2005; Parks & Hubert, 1995; Unoka, Seres, Aspan, Bodi & Keri, 2009). More broadly in the social psychology literature, the importance of distrust as a social mechanism for dealing with risk has been highlighted (McKnight & Chervany, 2001). As already espoused by Ellett et al. (2013) there is a lack of research investigating the relationship between distrust and nonclinical paranoia more broadly. This is compounded by a general difficulty in defining trust and distrust in the wider literature (McKnight & Chervany, 2001). Ellett et al. (2013) propose that conceptually paranoia could be viewed as one specific subset of the wider concept of distrust. This would allow for the fact that while paranoia by definition contains an element of distrust of another's motives, it is possible that distrust can exist without paranoia (e.g., one may consider another to be untrustworthy without assuming malevolence) (Ellett et al., 2013). Within social psychology distrust is viewed as a

highly complex and multi-dimensional phenomenon (Lewis & Weigert, 1985). McKnight and Chervany (2001) have proposed a multi-dimensional account of distrust which they commend for use across different areas of psychological research. Fruitful further research could beneficially explore distrust and paranoia to help elucidate their relationship. Multi-dimensional models such as that proposed by McKnight & Chervany (2001) may be helpful in pulling apart how these two constructs operate together. In light of the multi-dimensional nature of both distrust and nonclinical paranoia, this is likely to be complex and may require a series of investigations using questionnaire and experimental methodologies to triangulate research findings.

Future research could investigate the role of distrust-based competition across multiple PDG iterations to establish if there were changes in distrust-based competition over time. Multiple iterations of the PDG requires 'long-range' thinking (Pruitt & Kimmel, 1977) which is different to that when played in a single trial game. State paranoia is likely to increase across time as research suggests that people who compete on the PDG often misinterpret defensive reactions to their own behaviour as evidence that the other also has competitive intentions (Kelley & Stahelski, 1970). This results in a self-fulfilling prophecy, which often underlies persistent mutual competition (Pruitt & Kimmel, 1977). In this respect we might expect to find an increase level of competition and equally higher levels of distrust. It would be interesting to explore how this then alters state paranoia and its implications for trait paranoia in regard to the use of the PDG in measuring nonclinical paranoia across time.

Other areas that may be profitable to explore in relation to the PDG and paranoia is to establish if distrust-based competition on the PDG can be a marker for nonclinical paranoia in other settings. Interestingly, paranoia in clinical samples is commonly about

more than one person (Green et al., 2006). To this end, future research could look to investigate paranoia using the PDG when the opponent is a group acting collectively, rather than an individual. Experiments with a version of the PDG have revealed that groups, as compared with individuals, more frequently selected the competitive choice (e.g., Wildschut et al., 2002). The authors hypothesise differing explanations for this behaviour including the idea that group members can provide each other with social support to pursue their self-interest in a competitive way or that the anonymity provided by the group context allowed group members to avoid responsibility for competitive behaviour. We might then predict that people acting collectively in group-based PDG paradigms would compete more, but would this be through distrust-based competition? The role of social support and de-individualisation effects (Festinger, Pepitone & Newcombe, 1952; Zimbardo, 1969) from decreased self-evaluation and decreased evaluation anticipation may leave participants less aware of the potential threat of the opponent (which would indicate distrust-based motives for competition) and compete for greed-based motives instead. In turn this may affect the role of distrust-based competition as a marker for nonclinical paranoia; would this marker still hold in a group setting? What would the effects of playing a group-PDG be on state paranoia and its consequent association with trait paranoia? Additional research would be needed to answer these interesting questions definitely.

In summary, the present study has provided additional support for distrust-based competition in the PDG as a behavioural marker for nonclinical paranoia. Although it is important that this aspect of the study receives replication due to its relative infancy as a developing paradigm, the present study offers its findings in association with those

of Ellett et al. (2013) for the use of this simple online game as a measure of nonclinical paranoia in addition to traditional self-report measures.

4.2.3 Values and the PDG

Ellett et al. (2013) concluded their experimental paper with a number of suggestions for future research including the investigation of a wider range of motivations for PDG choice beyond that which they considered (namely distrust vs. greed motives). The third set of hypotheses in the present study looked to the human values literature for such additional motivations due to the fact that values serve as standards or criteria, and provide justification for choices and behaviours that individuals make (Bilsky & Schwartz, 1994). The aims of this third research area were therefore to extend the findings from Ellett et al. (2013) to broaden our understanding of how paranoia in the nonclinical population can be measured using the PDG.

Schwartz (1996) had previously found that the value of power was most strongly associated with the decision to compete on the PDG in his research into interpersonal cooperation. In contrast, he found that benevolence and universalism values were most strongly associated with the decision to cooperate on the PDG. The current study replicated this finding by reporting significant positive correlations between PDG competition and valuing power-dominance and power-resources. Contrastingly, no significant associations were found between the decision to cooperate and the predicted values of benevolence and universalism. In light of the role that distrust plays in PDG competition as a marker for paranoia (Ellett et al., 2013) and the theoretical rationale that links distrust to valuing security, it was also predicted that

security values would be associated with PDG competition. This was not found in the current study. The relationships between PDG choice and security (personal and societal) were not significant, nor was there a significant association between PDG choice and valuing face (a combination of power and security values).

The present research highlights the important association of valuing power and the decision to compete on the PDG as initially reported by Schwartz (1996). Individuals who value power, value exercising control over people and via control of material and social resources. In this respect competing on the PDG represents a behavioural display of their power values by exerting control over their opponent and subsequently controlling the available material resources (i.e., credits in the PDG 'payout' matrix). Ellett et al. (2013) argued that when individuals competed on the PDG because of perceived threat from a presumed malevolent opponent, they competed due to distrust, and this was associated with nonclinical paranoia. Findings already outlined from the current study (see Results, section 3.4.1, page 71) have shown that nonclinical paranoia is most associated with valuing face and least associated with valuing universalism-tolerance. These associations were not found for PDG choice as may be expected when PDG choice is associated with nonclinical paranoia. The most apparent explanation for this is that the current hypotheses for which values would be most associated with PDG choice did not include the role of motives and so is unable to more directly look at which values would be associated with *distrust-based* competition. The current findings lend themselves to hypothesizing that the values which are important to individuals who compete with distrust-based motives on the PDG may more directly map on to those associated with nonclinical paranoia (i.e., face and universalism-tolerance). Additional research would be necessary to empirical test this hypothesis.

4.2.4 Paranoia, Values and the PDG

The fourth aim was to combine the three areas of research on nonclinical paranoia, the PDG and human values theory to test whether more complex interactions between paranoia and values are associated with PDG competition. Two main types of analyses were undertaken: (1) moderation analysis to test whether trait paranoia moderates the relationship between values and PDG competition, and (2) mediation analysis to test whether values mediate the effect of trait paranoia and PDG competition.

The results showed that the relationship between power and security, and PDG choice was not moderated by trait paranoia. One potential explanation for this is considered within the context of the distribution of PS scores. No individuals reported a PS score in the top 10% of the questionnaires' possible range; the range for the current study was 20-88 out of a possible top score of 100. Following a square root transformation the PS did have acceptable levels of skew ($z = 2.34$, $p >.01$) but was at the ceiling for this definition (acceptable skew when z scores are < 2.58 at $p < .01$; Field, 2009) hence the distribution of PS scores were grouped in the lower end of the distribution, which may have reduced the variability of scores. Replication of the current study could look to increase the spread of scores on the PS such that the relationship between PDG choice and values for mild and more severe forms of nonclinical paranoia could be investigated differentially. A second consideration for the lack of moderating effects for trait paranoia on the relationship between values and PDG choice, concerns the fact that this relationship is actually better understood in terms of mediation and not moderation. The mediation analyses will now be discussed.

The mediation analyses showed that the effect of trait paranoia on PDG choice to compete operates indirectly through power. Higher trait paranoia translates to a higher PDG choice (i.e., towards the decision to compete, where 1=compete and 0=cooperate) as a result of a tendency for those who are more paranoid to value power more highly. This finding provides further evidence of the important role of power within nonclinical paranoia. In student samples, nonclinical paranoia has been shown to be associated with feelings of powerlessness (e.g., Ellett et al., 2003; Freeman, Garety, Bebbington, Smith et al., 2005). Recently Allen-Crooks and Ellett (2014) used Thematic Analysis to qualitatively investigate the phenomenology of why some individuals showing clear paranoid ideation do not go on to develop clinical paranoia. They showed that nonclinical paranoia reduces naturally over time. Seven major themes were identified in participants' explanations for changes in response to a single paranoid experience. In particular, one theme related to the change in the relationship with the persecutor such that individuals reported a reduction in their paranoid experience when the power dynamic between themselves and their persecutor was reduced. The findings of Allen-Crooks and Ellett (2014) highlight that the role of power in nonclinical paranoia is especially relevant within the interpersonal context of the power dynamic between the self and persecutor. It would be interesting to research whether manipulating a person's beliefs about the power dynamic between themselves and the other within the PDG would alter the relationship between trait paranoia, valuing power and PDG competition as presented within this hypothesis.

The current findings also supports recent research within severe persecutory delusions, which shows that power is important within clinical populations as well as nonclinical populations. Individuals with current persecutory delusions judge their

persecutors as more malevolent and powerful than themselves (Pagat & Ellett, 2014; Green et al., 2006). The greater the differential of power between self and persecutor was also reflected in levels of emotional wellbeing, such that individuals who felt more powerful in the face of their persecutors had lower scores on measures of depression and higher scores on measures of self-esteem (Green et al., 2006). Perceived power of the persecutor has also been established in the voices literature, highlighting that beliefs about the power of voices (omnipotence) are associated with distress and disturbance (Birchwood & Chadwick, 1997; Birchwood, Meaden, Trower, Gilbert & Plaistow, 2000). Collectively, these findings point towards important clinical implications in terms of the focus on interventions being to increase a person's sense of personal control and autonomy. These approaches have received empirical support in the voices literature such that a central component of CBT for psychosis is to change the individual's relationship with the voice (Chadwick & Birchwood, 1994; Chadwick, Birchwood & Trower, 1996; Chadwick, Sambrooke, Rasch, & Davies, 2000). With due regard to the fact that the present research utilized a nonclinical sample, the present findings may offer very tentative additional support to suggest that similar interventions aimed at increasing personal control and autonomy may have a beneficial role in reducing the distress of delusions (e.g., Pagat & Ellett, 2014). This focus on improving a sense of power through improving one's sense of self is in keeping with a growing body of research that links high levels of paranoid thoughts in nonclinical samples with low levels of self-esteem (Combs & Penn, 2004; Ellett et al., 2003; Martin & Penn, 2001).

It may be that these areas of research could be fruitfully combined to more fully understand the role of power and how it relates to one's sense of self in relation to

others. To this end, future research could look to experimentally manipulate power and explore the effect this has on paranoia, and also on PDG choice. Values which are most important to a person are more accessible (Bardi, 2000) and values affect behaviour only if they are activated (Verplanken & Holland, 2002). Schwartz's values have been shown to be amenable to activation through priming, which had a direct effect on predictable behaviour (e.g., Maio, Pakizeh, Cheung & Rees, 2009; Verplanken & Holland, 2002). Maio et al. (2009) used three priming manipulations to activate participants' values including a memory based sorting task, a scrambled words task and a written task where participants had to read a statement about the values of a fictitious person and describe how their own values were similar and different.

The present study did not find a mediating effect for the role of security in trait paranoia and PDG competition, despite the importance of the value of face (which involve power and security motivational goals) and nonclinical paranoia. Values relate to an individuals' commitment to one value in the absence of other competing values (Schwartz, 1992). The present study was conducted in the UK where it could be possible that compared to other cultures the necessity of valuing security is not present in the relative threat-free cultural climate of the UK. The relevance of the wider culture to have an impact on the accessible values of a population has been shown in a study by Schwartz (2001) who reported a far higher endorsement for security values than expected in a sample of Jewish students due to a co-occurring security crisis in Israel. Cross cultural research would be helpful to ascertain if the relationship between security values and paranoia, and the relationship between security values and PDG competition, differs as a result of the cultural climate and its impact on the accessibility of an individuals' value priorities. These relationships might also be experimentally

investigated by manipulating the level of interpersonal threat that an individual feels when playing the PDG by increasing their salience. For example, the player may be provided with information on their opponent, or be made to believe that they can hear their opponent, or see them, or perhaps even meet their opponent. Specific manipulations may be necessary to directly suggest the threat from their opponent as there is research to suggest that greater knowledge of the opponent in PDG paradigms produces somewhat more cooperation (Gardin, Kaplan, Firestone, & Cowan, 1973; Wichman, 1972).

Further investigation could seek to explore whether there are differences between experiences and processes in mild to severe nonclinical paranoia. Would value priorities change as a function of where an individual lies on the continuum of nonclinical paranoia? Would this have an impact on the role of power as a mediator between trait paranoia and PDG choice? Additionally, the current study could be replicated in clinical samples to establish whether the PDG paradigm is acceptable and valid as a marker for paranoia within samples that have severe delusions, and whether the values of people with such severe delusions are qualitatively or quantitatively different from those in nonclinical samples.

4.3 Theoretical and Clinical Implications

4.3.1 Nonclinical Paranoia: The Continuum Hypothesis

The present study found comparable scores on the Paranoia Scale (Fenigstein & Vanable, 1992) to that of the original paper. In this sample the mean PS score was 39.9 ($N = 221$) compared to 42.7 ($N = 581$; Fenigstein & Vanable, 1992). This provides

additional empirical support for the burgeoning evidence base of the prevalence of nonclinical paranoia, and it's relevance as a phenomenon of interest in its own right, and separate from clinical manifestations of persecutory delusions (Freeman, Garety, Bebbington, Smith et al., 2005). The results are also consistent with the increasingly regarded view that psychotic symptoms like those of persecutory delusions occur on a continuum of every day human experience (Freeman, Pugh et al., 2008; van Os et al., 2009).

4.3.2 Nonclinical Paranoia: Evolutionary Theory

The high prevalence of nonclinical paranoia in the general population have promoted many theorists and researchers to understand why it is so common. Ellett et al. (2003) were the first to suggest that an evolutionary perspective may provide an explanatory framework; a theory which has now garnered considerable support elsewhere (e.g., Bebbington et al., 2013; Kelleher, Jenner & Cannon, 2010; Preti & Cella, 2010). Ellett et al. (2003) proposed from an evolutionary perspective that paranoia is a trait that was selected and distributed in humans due to its adaptive value. We are certainly obliged to make decisions to trust or to mistrust on a daily basis and individuals who are trusting, open and never suspicious of the intentions of others may end up as naive objects of exploitation (Bebbington et al., 2013; Ellett et al., 2003). Consideration of the potentially hostile intentions of others can be a highly intelligent and appropriate strategy to adopt in order to ensure personal safety, and the ability to reproduce. In this way paranoia may be seen as a by-product of a cognitive system designed to detect threat, since, from a survival perspective, it is much worse to fail to recognise a threat (such as a malevolent other) than to mistakenly believe them to be benevolent (Dodgson

& Gordon, 2009). The evolutionary maxim "better safe than sorry" might thus explain why clinical paranoia is so notoriously resistant to change and why even nonclinical paranoia, once triggered in experimental settings, can be persistent (Ellett & Chadwick, 2007). Indeed, recent models by Morrison et al. (2011) have utilised this evolutionary conceptualisation of paranoia, as an evolved cognitive attentional response to the perception of interpersonal threat, to propose a metacognitive model of paranoia, based on Wells' (1995) model of Generalised Anxiety Disorder. They also report that a high degree of positive beliefs about paranoia acted as a survival strategy. This predicted severity of paranoia in their sample indicating that this evolutionary framework has face validity. Consequently, wariness of the intentions of others may be adaptive in some situations, and becomes a clinical problem only when it is excessive, exaggerated, distressing or interferes with functioning (Bebbington et al., 2013). In evolutionary theory this is explained as an example of 'cliff-edge' fitness, whereby certain traits may increase fitness up to a critical threshold, but beyond this point, fitness falls precipitously (Nesse, 2004). In the case of paranoia this would be from the overestimation of risk (Freeman & Freeman, 2008). The amalgamation of evolutionary theory applied to a theory of paranoia in addition to the understanding of placing nonclinical and clinical paranoia on a continuum lends increased utility that the study of the nonclinical phenotype may hold the key to understanding the persistence of psychosis in the population and provide a new perspective on aetiology and treatment (Kelleher, Jenner & Cannon, 2010).

4.3.3 Nonclinical Paranoia: Clinical Implications

The prevalence of paranoia in studies of the nonclinical population indicate that many people in the general population with delusions are not receiving assistance (Freeman, 2006). Indeed, although not at the severity of delusions reported in the clinical population, delusions in the nonclinical population are still associated with many unhelpful emotional and social difficulties including reduced subjective wellbeing, anger and frustration (Ellett et al., 2003) and distress, feelings of powerlessness, social isolation and giving up enjoyed activities (Freeman, Garety, Bebbington, Smith et al., 2005). Although this requires more research, Freeman (2006) states this may qualify as an unmet clinical need and have published a self-help book for '*Overcoming Paranoid and Suspicious thoughts*' aimed at individuals with nonclinical (and clinical) paranoia (Freeman, Freeman & Garety, 2008). Empirically it is known in the literature that paranoia is not confined to severe mental illness, but the publication of self-help books such as these help to consolidate this shift of knowledge and perspective into the general population. Findings from the current research can humbly offer support to this campaign to destigmatize paranoia, and free it from its associations with mental ill-health (Ellett & Chadwick, 2007).

This objective is especially important when the breadth and prevalence of stigma toward mental illness characterised by paranoia (namely psychosis) is known. Numerous quantitative and qualitative studies across the helping professions have shown that stigma towards individuals with psychosis is commonplace in members of the general population (Penn & Martin, 1998), and even within mental health professionals themselves (e.g., Faugier & Sargeant, 1997; Rao et al., 2009). This also crosses into stigma towards the families of those with a member with psychosis (e.g.,

Schulze & Angermeyer, 2003) and even stigma targeted at the individual from their own family (e.g., Phelan, Bromet & Link, 1998). The role of the present research as contributory to a drive for less stigmatized views toward those who do experience persecutory delusions is also consistent with movements in mental health provision toward Recovery models for severe mental health (e.g., Anthony, 2003; Repper & Perkins, 2003) and wider psychological provision that focuses on social inclusion (e.g., BPS, 2008).

In contrast to categorical views of psychosis that purport the experience as being qualitatively different from normal experiences, many treatment approaches to psychosis include a normalizing component aimed at educating the individual about dimensional views instead (Johns & van Os, 2001). This includes reducing self-stigma through imparting an appreciation of the symptoms of psychosis being present in those without a mental illness diagnosis, as well as laying them open to rational argument thereby bringing them into the realm of normal human experience. A normalizing approach is now common in Cognitive Behavioural Therapy (CBT; Kingdon and Turkington, 1994) and modified CBT for Psychosis (CBT-P; Fowler, Garety, & Kuipers, 1995; Sensky et al., 2000) and has been shown in empirical trials to help individuals with psychosis (e.g., Kingdon and Turkington, 1991; Kingdon and Turkington, 1994; Sensky et al., 1998). The normalizing agenda was very prominently provided as an introductory framework for Freeman, Freeman et al.'s (2008) self-help book, including the research studies covered within this thesis and referencing the paranoid quotes of famous respected individuals, a tactic also employed in clinical literature (e.g., Sivec & Montesano, 2012). The ultimate aim of the integration of nonclinical paranoia research and treatment programmes for paranoia is summed up by

Ellett & Chadwick (2007) that the word 'paranoia' would not imply mental illness, but would rather describe an ordinary psychological process characterised by a perception of planned intention to harm by others.

4.3.4 Values-Based Approaches to Paranoia: Clinical Implications

A novel aspect of the current study was its attempts to make exploratory investigations into the role that values may play in paranoia. The findings suggest that individuals who value security and power through maintaining one's public image and avoiding humiliation (face) have higher trait paranoia, and those who value acceptance and understanding for others (universalism-tolerance) report lower trait paranoia. Notwithstanding that these are initial results that require replication, and are cross-sectional in nature, it is possible that incorporating an awareness of values may be a helpful additional component in our developing understanding of nonclinical paranoia. For example, reported paranoia may be reduced through strengthening the components of face, perhaps through reaffirming and exploring a strong sense of self, or perhaps through building greater acceptance and tolerance of others. Indeed, recent research in the nonclinical population has shown that if one has the opportunity of affirming values within environmental conditions (high self-awareness and task feedback) the occurrence of paranoid thoughts significantly reduces (Kingston & Ellett, 2014).

Including a values-based understanding of the factors involved in the formation of paranoia for those who report some level of distress is also in line with formulation-based approaches in clinical mental health provision which aims to validate client experience (Corstens, Escher & Romme, 2008). Additionally, values-based approaches

such as Acceptance and Commitment Therapy (ACT) to psychological wellbeing have recently been shown to have promising beneficial results with individuals with psychosis (e.g., Bach, Hayes, & Gallop, 2012; Bach & Hayes, 2002; Gaudiano & Herbert, 2006; Oliver & Morris, 2013). Research into the efficacy of values-based approaches to psychosis are still in their infancy. As of such, no studies have portioned delusions from other psychotic symptoms, so it is currently unclear about the exact impact of that a values-based treatment approach would have specifically on delusions. However, these initial findings and their support from the present study to suggest a potential role for values in nonclinical paranoia suggests tentatively that a values-based approach to persecutory delusions may be efficacious. Additional research would be required to investigate this further, but could reported paranoia in clinical settings be reduced through strengthening the components of face, perhaps through reaffirming and exploring a strong sense of self, or perhaps through building greater acceptance and tolerance of others? It would be interesting to explore this within psychological interventions for individuals reporting persecutory delusions. The inclusion of measures of affective responses, such as anxiety, depression and self-esteem, could also be employed to more fully understand the processes by which strengthening an individual's value system has its impact on reported paranoia.

4.4 Strengths and Limitations

It is important that the findings are considered within the context of the strengths and limitations of the study's methodology. These will be outlined next.

4.4.1 Design

The study employed a cross-sectional design. By their nature cross-section studies cannot infer any causality between variables and caution is warranted in the interpretation of all data with this caveat in mind. Despite this, the use of cross sectional designs are the best way to determine prevalence and are useful at identifying associations that can then be more rigorously studied (Mann, 2003). Longitudinal research would be needed to explain the exact temporal relationship of variables and experimental methodologies would be needed to investigate any moderator or mediating variables.

Following from this limitation, the present study was predominantly exploratory and sought to investigate novel areas of interest between nonclinical paranoia and values. Consequently, due to the large number of variables of interest already present in the analysis plan, the study design did not additionally include a measure of variables known to inter-relate to paranoia and persecutory delusions. As discussed in the Introduction (see Introduction, section 1.4, page 16) the role of anxiety has been demonstrated to be central to the formation and maintenance of persecutory delusions (e.g., Freeman, Garety, Bebbington, Smith et al., 2005; Freeman et al., 2010; Freeman, Pugh et al., 2008; Freeman et al., 2012; Lincoln et al., 2008; Martin & Penn, 2001). Additionally, depression and self-esteem have also shown to be differentially associated with paranoia (Chadwick, Trower, Juusti-Butler, & Maguire, 2005; Ellett et al., 2003; Johns et al., 2004; Kinderman & Bentall, 1996; Martin & Penn, 2001; Trower & Chadwick, 1995).

Because these affective processes were not included in the study design, the present study cannot provide comment on the potentially explanatory role that they may

play in understanding and interpreting the findings of this thesis. As a consequence, it would therefore be highly recommended that the next steps to develop research in this area include measures of affective responses, notably anxiety, depression and self-esteem, as potential mediators or moderators to more comprehensibly elucidate the complex relationships between nonclinical paranoia, values and the use of the PDG.

The final limitation to address in regard to the study design relates to the number of distinct and specific hypotheses that were provided. In light of the study being partly exploratory, as well as having some empirical and theoretical rationale on which to make predictions, a total of seven hypotheses were presented. Future research could advantageously streamline this number by focusing more on the exploratory sections of the thesis thereby reducing the number of specific predictions. Conversely, now that tentative associations have been established between nonclinical paranoia and values, fruitful future research could be more targeted on fewer, more robust, hypotheses.

4.4.2 Sample

The number of participants recruited to the current study exceeded the suggested number recommended by the a priori power calculation. This is indicative of a sufficiently powered sample enabling the detection of any effects that were present and the reduction in the likelihood of a Type II error occurring. In terms of limitations, the present study used an under optimal convenience sample (Barker et al., 2003), but benefitted from the cost and accessibility advantages that this sampling strategy afforded. The sample was also self-selected. Research using opt-in strategies have been said to include higher proportions of individuals with some level of psychological difficulty (Freeman, Garety, Bebbington, Smith et al., 2005). That said, the present

study was advertised with no reference to psychological theory, and was instead advertised as a game of social strategy to reduce this effect. Secondly, the majority of the respondents were also students ($n = 80\%$) who may be prone to overestimating the levels of delusional beliefs compared to samples drawn from the general population (Lincoln & Keller, 2008). This also may have the effect of reducing the generalizability of the current study to other samples. The current study did utilise a measure of trait paranoia designed specifically for use with student populations however, and a fifth of the respondents were not students which went some way to increasing the representativeness of the sample.

A third limitation is that cultural differences within the current sample were not explored. An increased prevalence of paranoia in ethnic minority groups has been found at the more extreme end of the nonclinical continuum (Freeman et al., 2011). Samples representative of a broader mix of ethnicities may need to be specifically sought however, for example, the majority of the sample for the present study considered themselves to be White ($n = 78\%$) with only small percentages of other ethnicities (Asian, $n = 15\%$; Mixed Heritage $n = 7\%$). Lastly, only a brief screening question was used to ensure that this research sampled *non*clinical paranoia. A more stringent methodology could have been applied such as using the Structured Clinical Interview for DSM-IV Axis II disorders (SCID-II; First et al., 1997) administered by trained personnel, although the present study was limited by resources to be able to do this.

4.4.3 Measures

A robust strength of the current research is the use of the PDG to offer objective observable behaviours not reliant on questionnaire data. It is also economical and quick to administer. Its versatility and utility is even more apparent when developed into an electronic format accessed online. A general criticism typically levied at the use of game theory in social research is its lack of ecological validity. The real-world value of findings from paradigms such as the PDG has been criticised due to the difficulties that many studies have in extrapolating their research from laboratory to real-world settings (Pruitt & Kimmel, 1977). The present research does not suffer from this issue; instead, it sought to offer further support for the utility of the PDG to help measure and understand a real-world phenomenon; nonclinical paranoia. Game theory modelling is also held accountable for its perpetual inability to account for every set of variables that might influence strategy and outcome (Colman, 2003). In this respect there may have been a number of confounding, moderating or mediating variables that were not measured (or measured and not integrated into the analysis). A minor limitation is that no check was used to ensure that participants believed they were indeed playing another person. However, features of the online programme were designed to approximate the real-life experience of playing against another player such as incorporating time delays that ask the participant to 'please wait while we find another player….searching…..searching'. Additionally, if this tenant had not been met we would predict floor scores on the SPS because it specifically asks participants to rate their experience of another player. That said, future studies that utilise the PDG in its versatile online format could include a simple Likert scale to ascertain if participants

did in fact believe they were playing against another person which would clearly eliminate this minor limitation of design validity.

In terms of questionnaire measures, all self-report measures were carefully chosen for the purposes of the current study. There were some limitations however. As discussed previously (see Discussion, section 4.2.2, page 88) the hypotheses reliant on data from the SPS may have been undermined by the high modal score obtained from this sample. This tendency toward a distribution with positive kurtosis may have had the effect of obscuring any effects and increasing a Type II error. Secondly, the present study utilised the PVQ-R (Schwartz et al., 2012) for data collection on values. This is the most recent questionnaire aimed at assessing Schwartz's refined values theory (Schwartz et al., 2012). Although confirmatory factor and multidimensional scaling analyses do support the discrimination of the 19 values (Schwartz et al., 2012), full psychometrics for the PVQ-R are still currently being compiled (S. Schwartz, personal communication, May 30, 2014) which may reduce the validity of drawing conclusions from the present study.

4.5 Conclusion

Whilst acknowledging the limitations outlined, several conclusions can be drawn from the current study which include novel contributions to the literature. The present research provides additional support for Schwartz et al.'s (2012) refined theory of human values, which it did by exploring values theory in relation to the novel area of nonclinical paranoia. The findings indicate that higher trait paranoia is associated with valuing face, that is, holding a commitment to security and power through maintaining

one's public image and avoiding humiliation, and lower trait paranoia is associated with valuing universalism-tolerance, that is, showing acceptance and understanding for others. Secondly, the current findings replicate that of Ellett et al. (2013) to show that distrust-based PDG competition is a behavioural marker for nonclinical paranoia. Additionally, the present research offers a secondary behavioural marker for nonclinical paranoia based on a commitment to valuing power. Collectively, the current findings provide further evidence for the role of the PDG in the measurement and investigation of nonclinical paranoia, and more specifically provide a foundation for further research into the role that values could play in furthering this understanding, which may also have exciting clinical implications.

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APPENDIX A

Socio-Demographic Questions

Welcome to the study! Please take a few minutes to complete the information below before you start.

1. **Please enter your date of birth**

   [_____] * dd/mm/yyyy

2. **Please select your sex**

   Male
   Female

3. **Please select your employment status**

   Employed
   Unemployed
   Full-Time Education

4. **Please select your education status**

   O-Level/GCSE or equivalent
   A-Level or equivalent
   Degree or equivalent
   Post-Graduate or equivalent

5. **Which of the following best describe your ethnic group or cultural background?**

   White British
   Any Other White British
   Asian Background
   African Background
   Any Other Black Background
   Mixed White British and Other
   Mixed White Non-British and Other
   Any Other Mixed Background

6. **What is your religion?**

   Christian
   Buddhist
   Hindu
   Sikh
   Muslim
   Jewish
   Other
   None

7. **What is your marital status?**

   Single
   Married or cohabiting
   Widowed
   Divorced

8. **How many children do you have?**

   0
   1
   2
   3
   4
   5

9. **Have you had previous contact with mental health services for personal reasons?**

   Yes
   No

Portrait Values Questionnaire – Revised (PVQ-R)

(Schwartz et al., 2012)

Instructions

Here we briefly describe different people. Please read each description and think about how much that person is or is not like you. Choose the option that best describes how much the person described is like you. Please answer as honestly as possible and complete all questions.

HOW MUCH LIKE YOU IS THIS PERSON?

	Not like me at all	Not Like me	A little like me	Moderately like me	Like me	Very much like me
1. It is important to her to develop her own understanding of things.	○	○	○	○	○	○
2. It is important to her that there is stability and order in the wider society.	○	○	○	○	○	○
3. It is important to her to have a good time.	○	○	○	○	○	○
4. It is important to her to avoid upsetting other people.	○	○	○	○	○	○
5. It is important to her to protect the weak and vulnerable people in society.	○	○	○	○	○	○
6. It is important to her that people do what she says they should.	○	○	○	○	○	○
7. It is important to her never to be boastful or self-important.	○	○	○	○	○	○
8. It is important to her to care for nature.	○	○	○	○	○	○
9. It is important to her that no one should ever shame her.	○	○	○	○	○	○
10. It is important to her always to look for different things to do.	○	○	○	○	○	○
11. It is important to her to take care of people she is close to.	○	○	○	○	○	○
12. It is important to her to have the power that money can bring.	○	○	○	○	○	○
13. It is very important to her to avoid disease and protect her health.	○	○	○	○	○	○
14. It is important to her to be tolerant toward all kinds of people and groups.	○	○	○	○	○	○

	Not like me at all	Not Like me	A little like me	Moderately like me	Like me	Very much like me
15. It is important to her never to violate rules or regulations.	○	○	○	○	○	○
16. It is important to her to make her own decisions about her life.	○	○	○	○	○	○
17. It is important to her to have ambitions in life.	○	○	○	○	○	○
18. It is important to her to maintain traditional values and ways of thinking.	○	○	○	○	○	○
19. It is important to her that people she knows have full confidence in her.	○	○	○	○	○	○
20. It is important to her to be wealthy.	○	○	○	○	○	○
21. It is important to her to take part in activities to defend nature.	○	○	○	○	○	○
22. It is important to her never to annoy anyone.	○	○	○	○	○	○
23. It is important to her to have her own original ideas.	○	○	○	○	○	○
24. It is important to her to protect her public image.	○	○	○	○	○	○
25. It is very important to her to help the people dear to her.	○	○	○	○	○	○
26. It is important to her to be personally safe and secure.	○	○	○	○	○	○
27. It is important to her to be a dependable and trustworthy friend.	○	○	○	○	○	○
28. It is important to her to take risks that make life exciting.	○	○	○	○	○	○
29. It is important to her to have the power to make people do what she wants	○	○	○	○	○	○
30. It is important to her to plan her activities independently.	○	○	○	○	○	○
31. It is important to her to follow rules even when no-one is watching.	○	○	○	○	○	○
32. It is important to her to be very successful.	○	○	○	○	○	○
33. It is important to her to follow her family's customs or the customs of a religion.	○	○	○	○	○	○
34. It is important to her to listen to and understand people who are different from her.	○	○	○	○	○	○
35. It is important to her to have a strong state that can defend its citizens.	○	○	○	○	○	○

	Not like me at all	Not Like me	A little like me	Moderately like me	Like me	Very much like me
36. It is important to her to enjoy life's pleasures.	◎	◎	◎	◎	◎	◎
37. It is important to her that every person in the world have equal opportunities in life.	◎	◎	◎	◎	◎	◎
38. It is important to her to be humble.	◎	◎	◎	◎	◎	◎
39. It is important to her to expand her knowledge.	◎	◎	◎	◎	◎	◎
40. It is important to her to honor the traditional practices of her culture.	◎	◎	◎	◎	◎	◎
41. It is important to her to be the one who tells others what to do.	◎	◎	◎	◎	◎	◎
42. It is important to her to obey all the laws.	◎	◎	◎	◎	◎	◎
43. It is important to her to have all sorts of new experiences.	◎	◎	◎	◎	◎	◎
44. It is important to her to own expensive things that show her wealth	◎	◎	◎	◎	◎	◎
45. It is important to her to protect the natural environment from destruction or pollution.	◎	◎	◎	◎	◎	◎
46. It is important to her to take advantage of every opportunity to have fun.	◎	◎	◎	◎	◎	◎
47. It is important to her to concern herself with every need of her dear ones.	◎	◎	◎	◎	◎	◎
48. It is important to her that people recognize what she achieves.	◎	◎	◎	◎	◎	◎
49. It is important to her never to be humiliated.	◎	◎	◎	◎	◎	◎
50. It is important to her that her country protect itself against all threats.	◎	◎	◎	◎	◎	◎
51. It is important to her never to make other people angry.	◎	◎	◎	◎	◎	◎
52. It is important to her that everyone be treated justly, even people she doesn't know.	◎	◎	◎	◎	◎	◎
53. It is important to her never to do anything dangerous.	◎	◎	◎	◎	◎	◎
54. It is important to her never to seek public attention or praise.	◎	◎	◎	◎	◎	◎
55. It is important to her that all her friends and family can rely on her completely.	◎	◎	◎	◎	◎	◎
56. It is important to her to be free to choose what she does by herself.	◎	◎	◎	◎	◎	◎
57. It is important to her to accept people even when she disagrees with them.	◎	◎	◎	◎	◎	◎

APPENDIX C

Paranoia Scale (PS)

(Fenigstein & Vanable, 1992)

Please read each statement and choose the option that indicates how applicable each statement is to you. It is usually your initial response that is most accurate so please do not spend a long time considering each item. Please answer all questions and be as honest as possible.

1. **Someone has it in for me.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

2. **I sometimes feel as if I am being followed.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

3. **I believe that I have often been punished without cause.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

4. **Some people have tried to steal my ideas and take credit for them.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

5. **My parents and family find more faults with me than they should.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

6. **No one really cares much about what happens to you**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

7. **I am sure I get a raw deal in life.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

8. **Some people will use somewhat unfair means to get profit or an advantage, rather than lose it.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

9. **I often wonder what hidden reason another person may have for doing something nice for you.**

   Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

10. **It is safer to trust no one.**

    Not at all applicable to me | Slightly applicable to me | Moderately applicable to me | Very applicable to me | Extremely applicable to me

11. I have often felt that strangers were looking at me critically.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

12. Most people make friends because friends are likely to be useful to them.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

13. Someone has been trying to influence my mind.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

14. I am sure I have been talked about behind my back.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

15. Most people inwardly dislike putting themselves out to help other people.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

16. I tend to be on my guard with people who are somewhat more friendly than I expected.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

17. People have said insulting and unkind things about me.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

18. People often disappoint me.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

19. I am bothered by people outside, in cars, in stores, etc watching me.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

20. I have often found people jealous of my good ideas just because they had not thought of them first.

○	○	○	○	○
Not at all applicable to me	Slightly applicable to me	Moderately applicable to me	Very applicable to me	Extremely applicable to me

APPENDIX D

State Paranoia Scale (SPS)

(Ellett et al., 2013)

Before we reveal the outcome of the game please complete two final questionnaires.

Please select the options which best describe how you experienced the other player. As before, it is usually your initial response that is most accurate so please do not spend a long time considering each item. Please answer all questions and be as honest as possible.

1.
- Is friendly towards me
  - ○ Definitely friendly
  - ○ Probably friendly
  - ○ Maybe friendly
  - ○ Unsure
  - ○ Maybe hostile
  - ○ Probably hostile
  - ○ Definitely hostile
- Is hostile towards me

2.
- Wants to please me
  - ○ Definitely please me
  - ○ Probably please me
  - ○ Maybe please me
  - ○ Unsure
  - ○ Maybe upset me
  - ○ Probably upset me
  - ○ Definitely upset me
- Wants to upset me

3.
- Wants to help me
  - ○ Definitely help me
  - ○ Probably help me
  - ○ Maybe help me
  - ○ Unsure
  - ○ Maybe harm me
  - ○ Probably harm me
  - ○ Definitely harm me
- Wants to harm me

4.
- Respects me
  - ○ Definitely respects me
  - ○ Probably respects me
  - ○ Maybe respects me
  - ○ Unsure
  - ○ Maybe has it in for me
  - ○ Probably has it in for me
  - ○ Definitely has it in for me
- Has it in for me

Closed Reasons Assessment

(Insko et al., 2005)

Please indicate the extent to which each of the following concerns influenced your preferences (X or Y).

1.   I wanted to maximize my earnings
- Not at all
  ○ 1
  ○ 2
  ○ 3
  ○ 4
  ○ 5
  ○ 6
  ○ 7
- Very much

2.   I wanted to earn more than the other person
- Not at all
  ○ 1
  ○ 2
  ○ 3
  ○ 4
  ○ 5
  ○ 6
  ○ 7
- Very much

3.   I wanted both persons to earn as much as possible together
- Not at all
  ○ 1
  ○ 2
  ○ 3
  ○ 4
  ○ 5
  ○ 6
  ○ 7
- Very much

4.   I wanted to defend myself against the actions of the other person
- Not at all
  ○ 1
  ○ 2
  ○ 3
  ○ 4
  ○ 5
  ○ 6
  ○ 7
- Very much

5.   **I wanted to maximize the joint outcomes of both persons**
- Not at all
  - ○ 1
  - ○ 2
  - ○ 3
  - ○ 4
  - ○ 5
  - ○ 6
  - ○ 7
- Very much

6.   **I wanted to earn as much as possible**
- Not at all
  - ○ 1
  - ○ 2
  - ○ 3
  - ○ 4
  - ○ 5
  - ○ 6
  - ○ 7
- Very much

7.   **I wanted to minimize the difference between both persons**
- Not at all
  - ○ 1
  - ○ 2
  - ○ 3
  - ○ 4
  - ○ 5
  - ○ 6
  - ○ 7
- Very much

8.   **I wanted to maximize the difference between both persons in my favour**
- Not at all
  - ○ 1
  - ○ 2
  - ○ 3
  - ○ 4
  - ○ 5
  - ○ 6
  - ○ 7
- Very much

9.   **I wanted both persons to earn an equal amount**
- Not at all
  - ○ 1
  - ○ 2
  - ○ 3
  - ○ 4
  - ○ 5
  - ○ 6
  - ○ 7
- Very much

10. I did not trust the other person

- Not at all

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6

- ○ 7

- Very much

11. I did not want to lose

- Not at all

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5
- ○ 6

- ○ 7

- Very much

APPENDIX F

Program Screen Shots

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University of London

Decision making in a social context

The Game - Instructions

Welcome to the next part of the study, this involves playing a game against another player on-line.

The interaction between you and the other on-line player will be represented using the matrix below. For the interaction, you will be asked to simply select a choice, either "X" or "Y". The person with whom you are interacting will be given the same matrix and asked to make a choice. Both you and the other person will make their decision independently. Neither person will know which choice the other has selected until both persons have recorded and turned in their decision.

The numbers in the diagram below represent the payoffs in credits for both persons for each of the possible combinations of choices that could occur. You will play between one and six rounds in this game.

In each square of the interaction matrix, Your payoff is located in the upper right corner and The Other Player's payoff is located in the lower left corner. As you can see the amount of credits you will receive is not only determined by your choice but the choice of the other player. So when you come to make your choice it is worth considering what you think the other player will choose.

To familiarise you with the matrix, please take some time to go over the examples below.

Examples

Example 1: If You choose "Y" and The Other Player chooses "X" then You get 120 credits and The Other Player get 30 credits.

Example 2: If You choose "X" and The Other Player chooses "Y" then You get 30 credits and The Other Player get 120 credits.

Example 3: If You choose "X" and The Other Player chooses "X" then You get 90 credits and The Other Player get 90 credits.

Example 4: If You choose "Y" and The Other Player chooses "Y" then You get 60 credits and The Other Player get 60 credits.

Withdraw

Next >>

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Royal Holloway
University of London

Decision making in a social context

The Game - Practice Trials

Before you continue, could you please complete these questions as a practice before continuing to the game. For reference, the matrix is given again below...

You

	X	Y

The Other Player

X
90
90
120
30

Y
30
120
60
60

1. If You choose "X" and The Other Player chooses "Y", then -
   You get [ ]
   The Other Player gets [ ]

2. If You choose "Y" and The Other Player chooses "X", then -
   You get [ ]
   The Other Player gets [ ]

3. If You choose "X" and The Other Player chooses "X", then -
   You get [ ]
   The Other Player gets [ ]

4. If You choose "Y" and The Other Player chooses "Y", then -
   You get [ ]
   The Other Player gets [ ]

[Withdraw]   [Next >>]

Royal Holloway
University of London

Decision making in a social context

Social Strategies

Searching for other participants

Whilst we are locating an opponent for you, here are the instructions again:

Examples

Example 1: If You choose "Y" and The Other Player chooses "X" then You get 120 credits and The Other Player get 30 credits.

Example 2: If You choose "X" and The Other Player chooses "Y" then You get 30 credits and The Other Player get 120 credits.

Example 3: If You choose "X" and The Other Player chooses "X" then You get 90 credits and The Other Player get 90 credits.

Example 4: If You choose "Y" and The Other Player chooses "Y" then You get 60 credits and The Other Player get 60 credits.

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University of London

Decision making in a social context

Welcome to the game, good luck! First, here is a reminder of the rules:

	You	
	X	Y
X	90 / 90	120 / 30
Y	30 / 120	60 / 60

The Other Player

Y	
Your Move	Opponent's Move

X Y   Your selection is being confirmed ....

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University of London

Decision making in a social context

The Game - End

Thank you. You pressed **Y** and your opponent pressed '**X**' which means that you have won **120** credits.

That is the end of the game. Please click 'Next' to find out more about the study.

Withdraw   Next >>

APPENDIX G

Information Page

'The study of decision making in a social context'

Before you decide to take part, it is important for you to fully understand what the study involves and all relevant information. Please take time to read the following sheet carefully.

1. What does the study involve?

During the study you will be playing a short game against another randomly selected player. You will play between one and six rounds of this game. You will also complete five questionnaires. The game will be explained fully to you before you start and you will have a chance to practice before the game starts to ensure you understand the rules. The study will be completed online in one session. **It is not possible to logout and then login again at a later point; you must complete the study in one go. Please allow 15-25 minutes to complete the study.**

2. Who is involved in this study?

The principal investigator for this study is Jenna Williams, a Trainee Clinical Psychologist. Other investigators are Dr Lyn Ellett, lecturer in Clinical Psychology, and Dr Anat Bardi, senior lecturer in Psychology. All are from Royal Holloway University.

3. Why have I been asked to participate?

We are recruiting people aged between 18-65 to take part in the study.

4. Do I have to take part?

It is up to you to decide to take part. If you do decide to take part in the study you will be asked to sign (online) a consent form to agree that you have read and understand the study information.

5. Can I withdraw from the study?

Yes, you can withdraw at any time even if you have already signed the consent form without giving a reason. The data you have supplied up to that point will be removed and won't be used in the study.

6. What are the incentives to complete the study?

You will have the opportunity to win credits that you can trade in for a song of your choice online at the iTunes store. The amount of credits you earn will be determined by the choices you, and the other player make, when playing the game. The details of this will be explained in more detail before you start.

7. Will my taking part in the study be kept confidential?

All information which is collected during the course of the research will be kept strictly confidential. The questionnaire scores and task data will be anonymised and stored

securely on a database. Only the researchers will have access to the information you give during the study.

8. What are the possible disadvantages and risks of taking part?

There are no known disadvantages or risks to participating in this study. However, if you do feel worse after taking part in the study and you feel you need some support to help with difficult emotions, please contact your GP and inform the principal researcher via email (see question 12 for details). The university also offers a counselling service or you may also wish to contact the Samaritans.

Royal Holloway Counselling Service
Website: http://www.rhul.ac.uk/ecampus/welfare/counselling/home.aspx
Telephone: 01784 443 128
Email: counselling@rhul.ac.uk>
Location: FW171

Samaritans
Website: http://www.samaritans.org/
Telephone: 08457 90 90 90 (UK) or 1850 60 90 90 (ROI)
Email: jo@samaritans.org

9. What will happen to the results of the research study?

The research study will be written up and submitted in partial fulfillment of the requirements of the Doctorate in Clinical Psychology. It is also proposed that the findings of the study will be written up and submitted to a peer-reviewed journal. If you are interested in hearing about the results and conclusions of the study, please inform the principal researcher via email who will send you a summary once the research is complete.

11. Who has reviewed the study?

The study has been reviewed by the Royal Holloway University of London Department Ethics Committee.

10. Who is organizing the funding of the research?

The research is a requirement of Jenna Williams' doctoral thesis as part of her training in Clinical Psychology. Her training is funded by Camden and Islington Mental Health and Social Care Trust.

12. How can I get more information?

Please do not hesitate to contact Jenna Williams, the principal researcher, via email should you need any further information about the study. You may also contact Dr Lyn Ellett.

Jenna Williams: jenna.williams.2011@live.rhul.ac.uk

Dr Lyn Ellett: lyn.ellett@rhul.ac.uk

APPENDIX H

Consent Page

I have read and understood the information describing this study

☐ I Understand

I am aged between 18 and 65 years old and freely consent to participate

☐ Yes

I understand that I am free to withdraw from the study at any time

☐ I Understand

APPENDIX I

Debrief Page

'The study of decision making in a social context'

Below is more information about the study that we could not tell you before you completed it as it may have affected the decisions you made during the study. Please read this information so you can decide whether you are still happy to take part.

The study used some minor deception. You were made to think that you were playing the computer game against another player, when in actual fact you were playing against the computer which was pre-programmed. In addition, all participants in the study only played one round and received one iTunes voucher regardless of the choice they made on the game. The minor deception was necessary to investigate which strategy you would choose if you were playing for limited resources.

The questionnaires that you completed looked at paranoia and the values that you hold. The aim of the research was to look at the relationships between paranoia, values, and the strategy that you adopted in the game. Your participation in this study will help our understanding of paranoia as it exists within the general population.

Paranoid-like thoughts are a common everyday experience for many people and are not anything to worry about. If you do feel worse after taking part in the study and you feel you need help to manage difficult emotions please contact your GP and inform the principal researcher via email. The university also offers a counselling service or you may also wish to contact the Samaritans.

Royal Holloway Counselling Service
Website: http://www.rhul.ac.uk/ecampus/welfare/counselling/home.aspx
Telephone: 01784 443 128
Email: counselling@rhul.ac.uk
Location: FW171

Samaritans
Website: http://www.samaritans.org/
Telephone: 08457 90 90 90 (UK) or 1850 60 90 90 (ROI)
Email: jo@samaritans.org

Thank you for your participation in this research. If you have any further questions, please contact Jenna Williams via email on jenna.williams.2011@rhul.ac.uk.

Having been fully debriefed about the aims and purpose of this study, I am happy for my data to be included in the study.

▢ I Agree that my data can be used in this study

▢ I Disagree to my data being used in this study; please withdraw my data

APPENDIX J

Royal Holloway University of London Department Ethics Committee

Approval Email

Ref: 2013/006R1 Ethics Form Approved

✕ DELETE   ← REPLY   ⇐ REPLY ALL   → FORWARD   •••

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Psychology-Webmaster@rhul.ac.uk
Fri 03/05/2013 16:40

To: nwjt095@rhul.ac.uk; Ellett, Lyn;
Cc: PSY-EthicsAdmin@rhul.ac.uk; Leman, Patrick;

● Flag for follow up. Start by 07 May 2013. Due by 07 May 2013.

● You forwarded this message on 22/10/2013 19:28.

Application Details:

     Applicant Name: **Jenna Williams**

     Application title: **Values in nonclinical paranoia**