Coalitional Cognition and Emotional Factors: An Exploration of the Underlying Factors in Delusional Beliefs

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Declaration

I declare that this thesis is my original work. Any other sources have been referenced accordingly. The work has not been submitted for any other degree at the University of Sheffield or any other institution.

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Lay Summary

Delusional beliefs are sometimes seen in people who live with psychosis and similar conditions. They are beliefs that are usually not shared with other people and do not change even when there is evidence against that belief.

In the past, research has focused on understanding the cause of delusional beliefs and what factors keep them going. However, as these causes and factors are still not fully understood, the first part of this research aimed to conduct a systematic literature review to understand which emotional factors, such as anxiety or low mood, were present in people with delusions of reference; a subtype of delusions in which people believe that objects such as the television are sending them direct messages.

The review searched three online databases. A total of 15 papers were found. Each paper looked at different emotions. As the studies differed in design, and population of interest, and analysed their data in different ways, it was difficult to compare the findings and make strong conclusions. Furthermore, a quality assessment of the studies highlighted some issues with validity and reliability. Despite these limits, the study found that 11 emotions were linked to delusions of reference (anxiety, depression, elation, emotional instability, negative affect, phobic anxiety, shame, self-consciousness, social anhedonia, social anxiety, and threat) and four emotions were not (anger, aggression, physical anhedonia, and self-esteem).

Section two of this study looked at a new area called coalitional cognition which is a set of cognitive abilities that help people to navigate social situations. These cognitive abilities are used when creating or interacting with groups. One area of coalitional cognition, known as reality sharing, was explored. The study focused on two reality-sharing processes: a person's ability to share beliefs with others (belief sharing) and a person’s ability to judge

whether a person is similar to them and work with them to achieve a goal (judgements of similarity).

A total of 66 people took part in the study and were assigned to one of three groups based on whether they (1) experienced delusions, (2) had mental health difficulties but did not experience delusions, or (3) had no mental health difficulties. People were recruited from the NHS, charities, and social media. All participants completed online questionnaires and games that measured their demographics, mental health, and reality sharing. Overall, the findings suggested that people with delusions may have impairments in reality-sharing, which included their ability to share beliefs with others and judge who is similar to them and cooperate with that person to achieve a goal.

Both parts of this project identified ideas for clinical work. Clinicians working with people who live with delusions of reference could assess clients' experience of different emotions which will provide information for therapy goals. Furthermore, understanding more about coalitional cognition could support the delivery of psychology work or help clinicians identify whether people at risk of developing psychosis. However, for both studies future research is needed to confirm whether the results are correct and to understand more about each area.

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Preface

Section One: Literature Review

Section Two: Empirical Project

Section One: Literature Review

Emotion and Self-Related Emotional Factors in Delusions of Reference: A Systematic Review

Abstract

Background and Aims

Delusions of Reference (DoR) are a common delusion type; however little is known about which emotional factors lead to their development and maintenance. A systematic review was conducted to gain an overview of the literature on DoR and emotional factors. It aimed to answer the question: *what emotions and self-related emotional factors are associated with DoR?*

Method

Following registration on Prospero (ID: CRD42024494557), a systematic search of Medline, Scopus and PsycINFO was conducted on the 12th of March 2024. Studies were screened against inclusion and exclusion criteria. Risk of bias was assessed using a quality assessment tool and a narrative synthesis was conducted by emotion type.

Results

A total of 15 studies met the criteria. There was variation in the methodology of the included studies. The findings tentatively identified that 11 emotions were associated with DoR (anxiety, depression, elation, emotional instability, negative affect, phobic anxiety, shame, self-consciousness, social anhedonia, social anxiety, and threat) and four emotions were not associated with DoR (anger, aggression, physical anhedonia, and self-esteem). However, due to low study quality the results should be interpreted with caution.

Conclusion

The review provided an initial insight into the association between DoR and emotional factors. It also highlighted a scarcity of research. Future research should focus on using more sophisticated designs to understand emotion in DoR as it could provide important

information about their underlying and maintaining factors, which has theoretical and clinical implications.

Practitioner Points

- People who experience DoR may experience anxiety, depression, elation, emotional instability, negative affect, phobic anxiety, shame, self-consciousness, social anhedonia, and social anxiety. Assessing the client's experience of these emotions may direct therapeutic goals.
- Due to the scarcity of research, further research is required to understand which emotional factors are associated with DoR.
- Better quality research using more sophisticated designs would provide more information on which emotions lead to the formation and maintenance of DoR.

Key-words: Psychosis; Schizophrenia; Delusions of reference; Emotion

Introduction

Psychosis and similar conditions present as complex and multifactorial in origin (Garrity et al., 2013; Freeman & Garety, 2014). Research on positive symptoms of psychosis has emphasised the contribution of psychological mechanisms, involving emotional and reasoning processes, to the development and maintenance of psychosis (Bentall et al., 2009; Startup et al., 2007). Delusional beliefs are one positive symptom of psychosis, which have been defined as "fixed beliefs that are not amenable to change in light of conflicting evidence" (American Psychiatric Association, 2013). These beliefs are held with strong conviction (Bentall, 2018; Kiran & Chaudhury, 2009). The most common type of delusional beliefs are persecutory delusions, followed by delusions of reference (DoR), grandiose delusions, delusions of control and religious delusions (Collin et al., 2023). The variation seen in delusional beliefs may reflect that different psychological processes are at play (Garety et al., 2013).

Delusions of Reference

DoR, also known as referential delusions, has been defined as the belief that normal events have special meaning and are being directed at the individual (Bucci et al., 2008). For example, a person may believe that the public media has been arranged to communicate a message to them. DoR is of high prevalence in adult clinical populations (Collin et al., 2023). However, despite being one of the most common types of delusional belief, little is known about the underlying mechanisms that lead to their formation and maintenance. Several theories have attempted to explain this. Some neurobiological theories have suggested that brain dysfunction in the areas responsible for perception, attention, and attributional processes may contribute to the development of DoR as they may alter the processing of sensory information or the integration of self-referential and external stimuli (Corlett et al., 2013). Theories surrounding cognitive bias (Tversky & Kahneman, 1974) have suggested

that people with DoR may selectively attend to information in a way that reinforces their delusional belief. At the same time, individuals may attribute external events to themselves. This can occur even when there is no evidence to support their interpretations. Other theories surrounding anomalous experiences have suggested that individuals with DoR misinterpret external or internal sensory stimuli, which results in them believing that these stimuli are directed at them (Bell et al., 2008). Finally, theories focusing on social cognition have suggested that social isolation, interpersonal difficulties, or deficits in social perception may cause individuals with DoR to misinterpret social cues or interactions (Bentall, 2001; Bommer & Brune, 2006).

Some theories have suggested that emotions play a direct role in the development of delusions (Freeman and Garety, 2003). Others, however, have hypothesised that delusions serve as a defence against negative emotions. For example, delusions of grandiosity may develop as a defence against low self-esteem (Bentall et al., 1994; Smith et al., 2005). Research has shown that anxiety, fear, anger, shame, and guilt contribute to the formation and maintenance of delusions (Freeman et al., 2012; Garety et al., 2001; Kramer et al., 2014; Lincoln et al., 2017; Preti & Cella, 2010). Other emotions observed in people with delusions are depression (Campell, 2001), mania (Spizer, 1982) or a flattened affect (Bentall, 2006). However, despite this evidence, little focus has been placed on understanding emotion in different delusion types. More emphasis has been placed on emotion in psychosis-type presentations.

A meta-analysis (Riehle et al., 2023) explored the emotional experience of people at risk of developing psychosis and those diagnosed with schizophrenia. They found that, in response to pleasant stimuli, people diagnosed with schizophrenia and those at risk of developing psychosis had reduced positive emotions. No significant differences between patients and controls were found for anhedonia, however, another meta-analysis (Gruber et

al., 2018) found that people with schizophrenia or at risk of psychosis had higher levels of anhedonia (the inability to feel pleasure). Another systematic review and meta-analysis (Ludwig et al., 2019) found that emotion regulation is impaired in people with psychosis-spectrum disorders, and that maladaptive emotion regulation was specifically associated with positive symptoms. Finally, emotional stress has been found to act as a mediating factor between trauma and psychosis (Muddle et al., 2021)

Despite emotional factors being explored in psychosis and similar conditions, with some emphasis on delusions, there are no conclusions about how emotional experience varies by delusion type (Smurzynska, 2016). To begin to address this issue and given that DoR are one of the most common types of delusion, it would be both clinically and theoretically useful to understand the association between DoR and emotional factors.

Rationale and Current Review

The current systematic review has focused on summarising the literature that has assessed emotional factors in people with DoR. For this review, emotional factors were defined as affective elements that influence a person's thoughts, and behaviour. Affective elements are feelings, moods, and emotional states such as stress, jealousy, and happiness. They also encompassed attitudes such as positivity, open-mindedness and self-processes that are closely associated with emotion, specifically self-esteem, self-consciousness, and shame. As no systematic reviews or meta-analyses have been conducted on this topic, it was thought that a systematic review would provide a clear and comprehensive overview of the current literature on the topic and provide both theoretical and clinical implications. The review aimed to answer the following research question: *what emotions and self-related emotional factors are associated with DoR?*

Method

The current systematic review was pre-registered on Prospero on the 29th of January 2024 (https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42024494557). The review initially aimed to establish all psychological factors associated with DoR. However, as early searches revealed too many papers to review in the time frame, the review was adjusted to focus on emotional factors only. One adjustment was made to the pre-registration on 11th March 2024. The preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines and checklist (Page et al., 2021; Appendix A) were used to guide the review.

Eligibility Criteria

Predetermined inclusion and exclusion eligibility criteria (Table 1) were used to identify studies. The criteria were developed in line with the population, intervention, comparator, outcome, and study design (PICOS) framework (Methley et al., 2014). All full-text papers were compared against the inclusion and exclusion criteria shown in Table 1.

Table 1

Inclusion and Exclusion Criteria

	Inclusion	Exclusion
Population/ Participants	Adults aged 18 years and older who have experienced DoR. No restriction on population type (i.e., clinical, and non-clinical). No restrictions on country of origin, gender, and service type (outpatient, community, forensic or inpatient etc).	Studies that did not focus on people with DoR. Studies where participants are younger than 18. Studies that explore DoR as part of a neurological condition (i.e., delirium).
Intervention/ Exposure	Studies that measured the association between emotional factors (i.e., anxiety, shame, depression etc.) and DoR. Studies should have identified DoR through measures (i.e., Peter's et al. delusions Inventory- 21; ideas of reference interview scale etc.) that separate DoR from other delusion types (i.e., grandiose, paranoid etc.). Studies that considered cognitive factors if they also measured emotional factors.	Studies that did not examine the relationship between DoR and emotional factors.
Comparison/ control	Studies that assessed the relationship between DoR and emotional factors, whether there is a comparator/ control group or not.	No exclusion as no comparison/control group is necessary.
Outcome/s	Studies exploring emotional factors (i.e., self-esteem, depression, guilt etc.) associated with DoR using both validated / non-validated measures.	Any paper not relevant to the topic and has not explored emotional factors in DoR**.**
Study design	Quantitative studies (i.e., cross-sectional, experimental, longitudinal) published in a peer-reviewed journal. Mixed-methods papers to be included if quantitative data/ outcome was accessible. Studies that assessed the association between measures of DoR and emotional factors (i.e., self-esteem, anxiety, guilt etc.) using correlation, regression, or other statistics. Studies that assessed different delusional belief types if DoR were distinguishable from other delusion types. Studies that measured cognitive factors if they also measured emotional factors. No restrictions were placed on the study date or location. All papers were to have an English transcript available.	Qualitative studies. Unpublished literature such as grey literature. Non-empirical research (i.e., book chapters, conference papers, review articles). Studies that did not distinguish between different delusion types (i.e., did not clearly state DoR separately from other types). Case design (i.e., single case experiments, case studies or case series).Review studies (i.e., narrative, systematic, non-systematic, theoretical etc.). Studies which explored delusions following a neurological event (i.e., delirium). Studies written in a different language and not available in English.

Search Strategy

A comprehensive systematic search was conducted across three databases: PsycINFO (OVID interface), MEDLINE (OVID interface), and Scopus. The last date the search was updated was the 12th of March 2024. The use of three databases was sufficient to capture all relevant publications (Siddaway et al., 2019).

Key search terms were developed from looking at relevant literature and related reviews on delusions (Collin et al., 2023; Murphy et al., 2018). To ensure the search was robust, any related terminology, synonyms, singular and plural words, and variations in spelling (UK vs US) were considered. The author also considered the use of broad and narrow search terms to ensure the correct balance between sensitivity (retrieving articles that could be relevant) and specificity (retrieving relevant articles; Siddaway et al., 2019). Medical subject headings (MeSH) indexing was not used; however, truncation was used to broaden the search to include words with different endings and spellings (i.e., using *emoti** instead of *emotion* or *emotions*). As a scoping search conducted before the review revealed that papers that assessed cognitive factors sometimes considered emotional factors, the term cognition was included in the search.

The OVID interface combined each set of search terms using Boolean operators (AND/OR) which resulted in the following search string: (Delusion* OR Delud* OR Schizophreni* OR Psychosis OR Psychotic) AND referen* AND (Cogni* OR Emoti* OR Psychol*). This was used to generate sources across all three databases. In line with the eligibility criteria, there were no limiters placed on the search (i.e., publication dates, language).

Supplementary Search Techniques

Forwards and Backwards Search

To aid the retrieval of all relevant papers, manual backwards citation searching was conducted, as this technique has been deemed the most thorough to ensure all citations are checked (Briscoe et al., 2019). Forward citation is an important adjunct to backwards citation searching (Briscoe et al., 2019). Therefore, it was conducted using Google Scholar and Ovid to see whether the included papers had been cited by other publications. Forwards and backwards citation searching was last completed on the 20th of March 2024.

Grey Literature

The Cochrane Handbook for Systematic Reviews of Interventions recommends including grey literature within systematic reviews (Higgins et al., 2022). However, there is limited guidance on the best practices for using grey literature within reviews. Research has found that grey literature is difficult to access through traditional academic channels (i.e., electronic databases; Godin et al., 2015), difficult to quality control due to its lack of peer review process and could introduce variability as there is no standardised criteria for assessing its quality (Adams et al., 2016). Due to this, grey literature was excluded from the review.

Study Selection

All citations, generated from the search were imported into a reference manager Zotero. To enhance reliability, and minimise errors and selection bias (Stoll et al., 2019), two independent reviewers were involved in the screening process. Any duplicate papers were removed. Titles and abstracts were then screened (100% by the lead reviewer, and 10% by the second reviewer). Full-text papers were retrieved and screened against the eligibility criteria shown in Table 1 (100% by the lead reviewer, and 10% by the second reviewer). Both

reviewers were blind to each other's responses and a random number generator was used to select the papers for the second reviewer to screen. Any disagreements were resolved through discussion.

Data Extraction

Papers generated through database searching and supplementary searches were entered into Covidence review management software, which was used to support the extraction of key information from each study. Both reviewers were involved in the data extraction of all papers (100%). The following information was extracted from each paper: author, year, country, study design, sample setting and characteristics (i.e., age, gender, ethnicity, control, or comparison groups), sample diagnoses, DoR measures, emotion measures, and key quantitative findings including any statistical results that looked at the relationship between DoR and emotional factors only.

Quality Assessment

A quality assessment was conducted to assess the risk of bias. As all obtained studies had a cross-sectional, longitudinal or cohort design, the National Heart, Lung, and Blood Institute (NHLBI) quality assessment tool for observational cohort and cross-sectional studies (NHLBI, 2013; appendix B) was selected and adapted. The Newcastle-Ottawa scale (NOS; Wells et al., 2024) was considered as it is a validated tool commonly used to assess bias. However, the studies included in the current review mostly had cross-sectional designs, and this scale had not been validated for cross-sectional studies. Furthermore, the assessment provided a total score whereas research has suggested that checklists provide more useful information about study quality (Boland et al., 2017). Furthermore, the National Institute for Health and Care Excellence quality appraisal checklist for quantitative intervention studies was also considered. However, this tool is not currently recommended (Lu Ma et al., 2020).

The NHLBI contained 14 items which assessed each study's methodological quality by looking at the objectives, population, participation rate, recruitment strategy, sample size justification, power and loss over time, measures, assessment of exposure, blinding strategy, and adjustment for confounding variables. Two independent reviewers conducted the quality assessment on all 15 papers to reduce performance bias (Gold et al., 2012). Any discrepancies in response were resolved through discussion.

Table 2 displays the scoring criteria used for each quality assessment item. As research does not recommend providing an overall score of quality (Boland et al., 2017), the scores given for each item were displayed in a table (see results section).

Table 2

Scoring criteria

Scoring Code	Description
NA	Not applicable
NR	Not Reported
Y	Yes: none or minimal risk of bias is present. The study adequately met this item.
P	Partial: some sources of bias were apparent. The study partially met this item.
N	No: the source of bias is significant. The study did not meet this item.

Data Synthesis

Following Economic and Social Research Council recommendations (Popay et al., 2006), a narrative synthesis was conducted. Emotional factors (i.e., anxiety, depression, shame etc.) were grouped before the synthesis. Papers that looked at similar emotional factors were grouped (i.e., social, phobic, and general anxiety were placed together under anxiety).

Meta-analysis would have been the preferred choice of design, as it has been considered the gold standard (Impellizzeri et al., 2012). However, due to the broadness of the research question, it was anticipated that there might be significant heterogeneity between

studies due to differences in design, population, measures, and statistics, which may not be comparable. Meta-analytical techniques were considered where four or more papers measured the same construct. However, as the studies lacked quality (see quality assessment) and significant heterogeneity was observed between studies (as studies used different samples and measures to measure the same emotional factor) a meta-analysis was not conducted.

Results

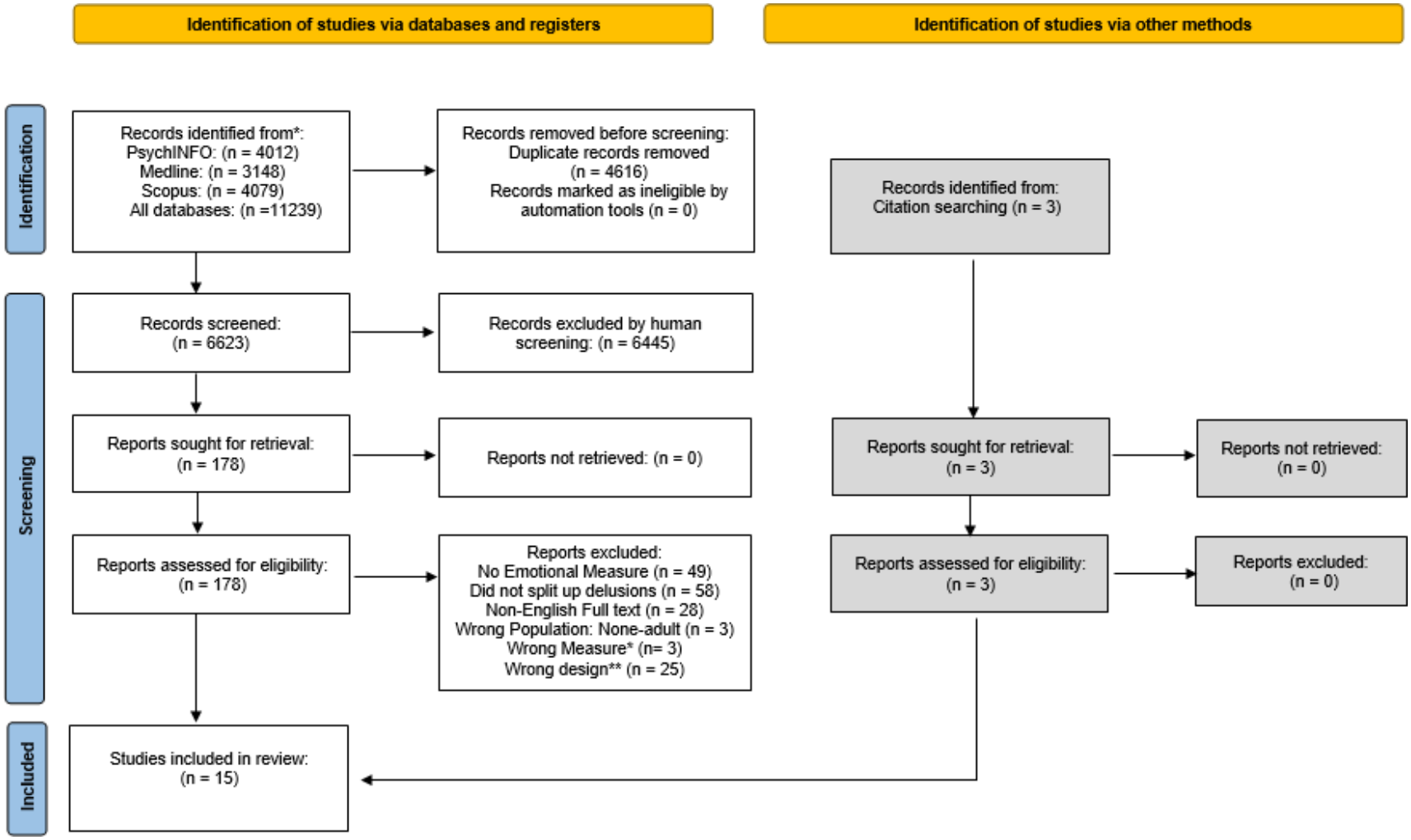
Search and Selection Process

The PRISMA diagram (Figure 1) displays the flow of information through each phase of the review. The systematic search resulted in 11239 papers (PsychINFO = 4012, Medline = 3148, Scopus = 4079). All papers were exported to Zotero (a reference manager), and 4616 duplicates were removed. In total, 6623 titles and abstracts were screened. A total of 6445 papers were excluded as they did not meet the inclusion criteria. This resulted in 178 papers included for full-text review. The total number of studies retained following the full-text review was 12. One further paper was identified from backwards citation searching and two papers from forward citation searching. The total number of papers included in the review was 15.

Two studies (Kollias et al., 2008; & Meyer & Lenzenweger, 2009) met the majority of the inclusion criteria however their sample contained participants who were 17 years old. It was decided to include these studies as the majority of the sample was 18 and above and they provided useful information about emotional factors in DoR.

Figure 1

PRISMA Diagram (Page et al., 2021)



*Wrong measure: Biological factors (n = 2), Cognitive factors (n = 1) **Wrong design: Book (n = 3), Case design (n = 4), Review (n = 11), Editorial Letter (n = 2), Theoretical Review (n = 4)

Study Characteristics

Key study characteristics are shown in Table 3. Of the 15 included articles, six studies were conducted in the United States of America (Ben-Zeev et al., 2012; Meyer & Lenzenweger 2009; Morrison & Cohen 2014; Ulrich et al., 2013; Warman et al., 2010; and Warman & Lysaker, 2011), three in Spain (León-Palacios et al., 2019; Rodriguez-Testal et al., 2019; Senin-Calderon et al., 2017), and one each in Italy (Borrelli et al., 2023); the United Kingdom; (Hartley et al., 2012); Greece (Kollias et al., 2008); the Netherlands (Nederlof et al., 2014); and Switzerland (Unterrassner et al., 2017). Of these studies, one was a cohort study (Ulrich et al., 2013), one was a longitudinal study (Ben-Zeev et al., 2012), and the rest had cross-sectional designs. The smallest sample size was 30 (Warman & Lysaker, 2011) and the largest was 3156 (Rodriguez-Testal et al., 2019). Nine studies had patient samples containing people with schizophrenia, schizoaffective disorder, and other psychosis-based diagnoses from inpatient, outpatient and community settings where stated (Ben-Zeev et al., 2012; Borrelli et al., 2023; Hartley et al., 2012; Kollias et al., 2008; León-Palacios et al., 2019; Morrison & Cohen 2014; Rodriguez-Testal et al., 2019; Ulrich et al., 2013; and Warman & Lysaker, 2011), five studies had student samples (Meyer & Lenzenweger 2009; Nederlof et al., 2014; Preti et al., 2019; and Warman et al., 2010) and one study recruited from the general population (Unterrassner et al., 2017). Five studies had control groups (León-Palacios et al., 2019; Meyer & Lenzenweger 2009; Morrison & Cohen 2014; Rodriguez-Testal et al., 2019; and Senin- Calderon et al., 2017). Across the studies, participants' mean age ranged from 19.32 to 48.93. Gender ranged between 14.4% female to 73% female with a mean of 41%. No studies considered other gender categories. Ethnicity was reported in five of the 15 studies. Of these studies, one provided a breakdown of ethnicity types (Ben-Zeev et al., 2012), whereas four only reported the percentage of white

individuals (Morrison & Cohen 2014; Ulrich et al., 2013; Warman et al., 2010; and Warman & Lysaker, 2011).

Table 3

Study Characteristics and Main Findings

Authors (year) Country	Study design	Sample (n) characteristics and setting	Sample diagnoses	DoR measure, number of items, validity, and reliability	Emotion measure (emotion)	Statistical test and main findings
Ben-Zeev et al., (2012) USA	Longitudinal	Total n=130. Mean age = 46.2, SD =11.24. Gender: male = 59%, female = 41%. Ethnicity = 59% White, 15% African American, 14% Hispanic, and 12% other. Setting: Community	Schizophrenia or schizoaffective disorder	ESM question measured on a 7-point Likert scale asked: "Since the last questionnaire, have you felt that someone could communicate with you through the television or radio?"	SERS-SF (self-esteem) ESM questions "How anxious do you feel right now?" (anxiety)' ''How sad do you feel right now?'' (depression)	Multi-level modelling Anxiety did not significantly predict the occurrence of DoR (r = .03 (SE=0.08), OR=1.03 [0.89, 1.20], p >.05); depression did not significantly predict the occurrence of DoR (r = -.05 (SE=0.11) OR=.95 [3.83, 21.86], p >.05); low self-esteem positively and significantly predicted the occurrence of DoR (r = .07 (SE= 0.02) OR=1.07 [1.04, 1.11] p<.01).
Borrelli et al., (2023) Italy	Cross-sectional	Total n= 101. Mean age = 35.4, SD = 13.5. Gender: male =64.4%, female = 35.6%. Ethnicity: NR. Setting: inpatient	Schizophrenia	RTS PDI-21(DoR items)	PANAS (negative affect) ESS (Shame)	Spearman's Correlation Shame was positively and significantly correlated with DoR (r=.601, p = .01); negative affect was positively and significantly correlated with DoR (r =0.444, p=.01).
Hartley et al., (2012) UK	Cross-sectional	Total n=229 (DoR n = 101). Mean Age= 37.9, SD = 9.48. Gender: male = 85.4%, female = 14.4%. Ethnicity: white = 84.3%, no other	Schizophrenia, schizophreniform, or schizoaffective disorder. Participants also met DSM-IV	PANSS To determine the presence of DoR, PANSS symptom summary sheets	PANSS (anxiety and depression)	T-test Anxiety was negatively and significantly less in people with DoR compared to other delusion types: t(204) = -2.35, p =.020. Depression was negatively and significantly less in

		reported. Setting: no specific setting stated.	diagnosis of drug and/ or alcohol dependence.	were coded using the DAHC-MAN.		people with DoR compared to other delusion types: t(204) = -2.28, p = .024.
Kollias et al., (2008) Greece	Cross-sectional	Total n= 62. Mean age = 30.33, SD = 8.91. Gender: male = 61.3%, female = 38.7%. Ethnicity: NR. Setting: inpatient	Schizophrenia	CDSS (DoR items)	PASr (physical anhedonia) SASr (social anhedonia)	Spearman's Product moment correlation Physical anhedonia was not significantly correlated with DoR (r= .138, p= .289); Social Anhedonia was positively and significantly correlated with DoR (r = .253, p = .049).
León-Palacios et al., (2019) Spain	Cross-sectional	Total n =437 (patients n= 142; student control group n= 295). Patient group mean age = 34.21, SD = 12.41. Control group mean age = 24.38, SD = 9.69. whole sample gender: male = 38.7%, female = 61.3%. Ethnicity: NR. Control group setting: university students, patient group = public and private mental health centres.	Patient group: depressive disorders (n = 22); adjustment disorders: (n = 7); somatoform disorders: (n = 19); anxiety disorders: (n= 33); schizophrenia and other psychotic disorders (n = 39); bipolar disorder: (n = 12); eating behaviour disorders (n = 3); personality disorders (n = 7).	RTS	ELES (threat)	Pearson's Correlation Whole sample correlations only. The groups were not compared. DoR and threat were positively and significantly correlated (r= .412, p<0.01). Mediation analyses There was a positive and significant total effect for threat predicting DoR (B= 0.36, SE= 0.04, t=9.44, CI= 0.29, 0.44, p<.01).
Meyer & Lenzenweger (2009) USA	Cross-sectional	Total n= 102 (schizotypy n= 30; social anxiety n= 28; normal control group n= 44). Total sample mean age = 19.38, SD = 4.00. Schizotypy gender: male = 23%, Female= 77%. Social anxiety gender: male = 32%, female = 68%. Normal	No subject was classified as having a schizophrenia spectrum disorder	RTS PDI-40 (DoR items)	SIAS SASr (social anhedonia) BDI-II (depression) STAI (state and trait anxiety)	Pearson product-moment correlation coefficients There was a weak, positive correlation between DoR and social anhedonia (r= 0.3). DoR was positively, moderately, and significantly correlated with depression (r=0.35), trait anxiety (r=0.45), state anxiety (r=0.34) and

		control group gender: male = 55%, female =45%. Ethnicity: NR. Setting: university students.			PANAS (negative affect)	negative affect (r=0.46). These correlations were used to guide ANCOVAs. No specific significance levels were provided.
Morrison & Cohen (2014) USA	Cross-sectional	Phase one total sample = 1148. Phase two total sample = 80 (experiment: 44, Control: 36). Experiment group mean age =19.45, SD = 1.58. Control group mean age = 19.97, SD = 6.27. Experiment group gender: male = 23%, female= 77%. Control group gender: male = 31% female = 69%. Experiment group ethnicity: 86% white, no other reported. Control group ethnicity: 75% white, no other reported. Setting: all were undergraduate students.	NR	RTS	SIAS (social anxiety)	Correlation (type not specified) Social anxiety and DoR were not significantly correlated (r = .12, p = .22)
Nederlof et al., (2014) Netherlands	Cross-sectional	Total n = 120 university students. Mean age = 20.29, SD = 2.60. Gender: male = 25%, female = 75%. Ethnicity: NR. Setting: university students	NR	GPTS	AQ (aggression)	Pearson's correlation DoR was not associated with aggression: r is between .03 and .13, p > .10). No further statistics were provided.
Preti et al., (2019) Italy	Cross-sectional	Total n = 243 undergraduate students. Mean age = 24, SD = 3.6. Gender: male = 44.9% female = 55.1%. Ethnicity:	NR	GPTS	SPQ-BR (excessive social anxiety)	Spearman's Rho DoR was positively and significantly correlated with excessive social anxiety (r=0.35, p<.001).

		NR. Setting: university students.				
Rodriguez-Testal et al., (2019) Spain	Cross-sectional	Total n = 3156 (control group n =2480, patient group n = 676). Control group mean age = 31.56, SD = 12.38. Patient group mean age = 34.63, SD = 12.44. Control group gender: male= 63.2%, female = 36.8%. Patient group gender: male =59, female = 41. Ethnicity: NR. Control group setting: students. Patient group setting: outpatient clinic	Depressive disorders =136; adjustment disorders= 64; anxiety disorders = 152; somatoform disorders = 44; bipolar disorders = 34; schizophrenia and other psychotic disorders = 154; eating disorders = 23; others applicable to axis 1 = 17; personality disorders cluster = 11; schizotypal personality disorder= 5; paranoid personality disorder = 5; schizoid personality disorder = 1; personality disorders cluster = 15; personality disorders cluster = 8; unspecified personality disorders = 18	RTS	GHQ-28 (anxiety and depression) RSCS (public self-consciousness)	Pearson correlation In the patient group, DoR were positively and significantly correlated with anxiety (r= 0.125, p<.001); depression (r= 0.199, p<.001); and public self-consciousness (r= 0.225, p<.001). In the control group, DoR was positively and significantly correlated with anxiety (r= 0.300, p<.001); depression (r= 0.289, p<.001); and public self-consciousness (r= 0.274, p<.001).
Senin-Calderon et al., (2017) Spain	Cross-sectional	Total n = 574 (patient n =298, control group n = 278). Patient group mean age = 37.97, SD = 13.41. Control group mean age = 34.53, SD = 12.68. Patient group gender: male = 45.9%, female = 54.1%. Control group gender: male = 43.2%	Personality disorders: n=27; mood disorders: n=61; adjustment disorders: n=27; somatoform disorders: n=27; anxiety disorders (panic, agoraphobia, obsessive-compulsive	RTS	RSCS (public and private self-confidence) GHQ-28 (anxiety and depression)	Pearson correlation DoR and anxiety were positively and significantly correlated (r= .383, p <0.01); DoR and depression were positively and significantly correlated (r= .367, p <0.01); DoR and public self-consciousness were positively and significantly correlated (r= .347, <0.01); DoR and private self-

		female = 56.8%. Ethnicity: NR. Patient setting: inpatient and outpatient. Control group setting: general population.	disorder): n= 56; schizophrenia and other psychotic disorders (paranoid schizophrenia, delusional disorder): n= 89.			consciousness were positively and significantly correlated (r= .266, <0.01). Mediation There was a significant direct effect of anxiety on DoR ($p < .01$). However, this effect disappeared when mediation variables were added to the model ($c' = .013$, $p = .778$). Indirect effects: depression positively mediated the relationship between anxiety and DoR (axb = .087, p=.024 ,CI = .047 to .1.28]); public self-awareness positively mediated the relationship between anxiety and DoR (axb = .025, p=.011 [CI = .009 to .045]). Total effect: $c = .203$, $p < .001$.
Ulrich et al., (2013) USA	Cohort study	Initial total n =1136 (859 were reinterviewed at time 1 (75.6%); 818 at time 2 (72.0%); 756 at time 3 (66.6%); 739 at time 4 (65.1%); and 726 at time 5 (63.9%). Sample mean age = 29.7, SD= 6.2. Gender: male = 58.7%, female = 41.3%. Ethnicity: white = 69.1%, no other reported. Setting: inpatient and community	Nonaffective psychosis: n = 245; affective disorder including depression and bipolar disorder n = 596; substance abuse/ dependence n = 274; and personality disorder n = 21.	DIS (DoR question of being sent messages through TV/ radio)	MMDAS (anger, elation)	Adjusted odds ratio There was a significant inverse association between DoR and anger (AOR = 0.37, CI= 0.19, 0.74, p<.05). DoR caused anger to decrease. There was a significant association between DoR and elation (AOR = 4.74, CI= 2.38, 9.46, p<.05). An increase in DoR caused an increase in elation.
Unterrassner et al., (2017) Switzerland	Cross-sectional	Total n = 237 (206 included in analyses). Mean age = 33.11, SD = 11.23. Gender: male = 65%, female = 35%.	None specified.	SPQ (DoR questions)	SCL-90r (anxiety, phobic anxiety,	Spearman's Rho correlations Physical anhedonia and DoR were not significantly correlated ($r = -0.07$, $p = 0.292$); anxiety and DoR were

		Ethnicity: NR. Setting: general population.			social anxiety, depression, emotional instability). PASr (physical anhedonia)	positively and significantly correlated (r=0.39, p<.000); phobic anxiety and DoR were positively and significantly correlated: r= 0.33, p< .000); social anxiety and DoR was positively and significantly correlated (r= 0.18, p=.01); depression and DoR were positively and significantly correlated (r= 0.39, p< .000); emotional instability and DoR was positively and significantly correlated: r= 0.29, p< .000). Regression analyses DoR negatively predicted anhedonia (β= -.22 [-.38, -.06], p=.009); DoR positively predicted anxiety (β= 0.16 [0.01, 0.31], p=.040); DoR positively predicted phobic anxiety (β=0.28 [0.11, 0.44], p<.001); DoR did not predict social anxiety (β= 0.70 [-0.14, 0.19], p=.070); DoR positively predicted depression (β= 0.20 [0.05, 0.36], p=.012); DoR positively predicted emotional instability (= 0.25 [0.08,0.41], p= .004).
Warman et al., (2010) USA	Cross-sectional	Total n = 121. Mean age = 19.32, SD = 1.74. Gender: male = 27%, female = 73%. Ethnicity: 85% white, no other reported. Setting: undergraduate students.	No diagnosis of schizophrenia, schizoaffective disorder, schizophreniform disorder, or delusional disorder.	PDI-40 (DoR questions)	RSES (self-esteem).	There was a small but significant negative correlation between self-esteem and DoR (r = -0.20, p= .025)

Warman & Lysaker, (2011) USA	Cross-sectional	Total n= 30. Mean age = 48.93, SD = 5.11. Gender: 100% male. Ethnicity: 50% white, no other reported. Setting: outpatient medical centre.	Confirmed diagnoses of schizophrenia or schizoaffective disorder.	PDI-40 (DoR questions)	MSEI (self-esteem).	Self-esteem was not significantly correlated with DoR (r -0.26, p 0.16).

Note: AOR: Adjusted Odds Ratio; AQ= Aggression Questionnaire; BAI= Beck Anxiety Inventory; BDI-II= Beck Depression Inventory 2;CAPE= Community Assessment of Psychic Experiences; CDSS= Calgary Depression Scale for Schizophrenia; DAHC-MAN= Delusion and Auditory Hallucination Content Coding Manual; DIS=Diagnostic Interview Schedule; DoR = Delusions of Reference; DSM-IV= Diagnostic and Statistical Manual of Mental Disorders five; ELES= Early Life Experiences Scale; ESM=Experience Sampling Method; ESS= Experiences of Shame Scale; GHQ-28= General Health Questionnaire-28; GPTS= Green Paranoid Thoughts Scale; MMDAS= The MacArthur-Maudsley Assessment of Delusions Schedule; MSEI= Multidimensional Self-Esteem Inventory; NR= Not Reported; PANAS= Positive and Negative Affect Schedule; PANSS= Positive and Negative Syndrome Scale; PASr= the Revised Physical Anhedonia Scale; PDI= Peters et al., Delusions Inventory; RSCS= Revised Self-Consciousness Scale; RSES= Rosenberg Self-Esteem Scale; RTS= Referential Thinking Scale; SASr= the Revised Social Anhedonia Scale; SCL-90r= the Revised Symptom Checklist-90; SD= Standard Deviation; SIAS= Social Interaction Anxiety Scale; SPQ-BR=Schizotypal Personality Questionnaire-Brief; SERS=Self-Esteem Rating Scale; STAI = State-Trait Anxiety Inventory.

Delusion of Reference Measures

All 15 studies measured DoR. In total 12 studies used validated questionnaires. The Referential Thinking Scale (RTS; Lezenweger et al., 1997) was used by six studies (Borrelli et al., 2023; León-Palacios et al., 2019; Meyer & Lenzenweger, 2009; Morrison & Cohen 2014; Rodriguez-Testal et al., 2019; & Senin-Calderon et al., 2017). The RTS used 34 items to measure referential thinking. More yes responses indicated a higher presence of DoR. It has good internal consistency (α >.85 in a student sample, Lezenweger et al., 1997; clinical sample α =.90, Senin-Calderon et al, 2010). The Peter's Delusion Inventory 40-item measure (PDI-40; Peters et al., 1999) was used by three studies (Meyer & Lenzenweger, 2009; Warman et al., 2010; & Warman & Lysaker, 2011). The PDI-40 used 40 items to measure delusions and includes items that measure DoR. Scores on the DoR items were indicative of the presence of DoR. It had good internal consistency (α=.88 in the general population; Peters et al., 1999). One study (Borelli et al., 2023) used the shorter Peter's Delusion Inventory 21-item measure (PDI-21; Peters et al., 2004). Scores on the DoR items were indicative of the presence of DoR. Internal consistency was good (α=.82 in a mixed sample of people with delusions and the general population; Peters et al., 2004). Two studies (Nederlof et al., 2014; & Preti et al., 2019) used the Green Paranoid Thoughts Scale (GPTS; Green et al., 2008). The GPTS is a 32-item measure which has 16 items that measure DoR (clinical sample: α=.90, non-clinical sample = 0.95; Green et al., 2008). Higher scores were indicative of the presence of DoR. One study (Kollias et al., 2008) used the Calgary Depression Scale for Schizophrenia (CDSS; Addington et al., 1994). The CDSS is a nine-item measure which contains questions related to DoR. Scores on the DoR items were indicative of the presence of DoR. It has good internal consistency (α=.84 for people with schizophrenia; Addington et al., 1994). One study (Unterrassner et al., 2017) used the Schizotypal Personality Questionnaire (SPQ; Raine, 1991). The SPQ has 74 items modelled on the Diagnostic and Statistical Manual of Mental

Disorders three revised (DSM-III-R) criteria for schizotypal personality disorder. It has items related to DoR. Scores on the DoR items indicated the presence of DoR. It has excellent internal consistency (α=.91 in the general population; Raine,1991). Finally, one study (Morrison & Cohen, 2014) used the Brief Revised version of the Schizotypal Personality Questionnaire (SPQ-BR; Cohen et al., 2010). The SPQ-BR has 34 items with questions that measure DoR. Scores on the DoR items were indicative of the presence of DoR. It has excellent internal consistency (α=.95 in undergraduate students; Cohen et al., 2010).

Three studies used other methods to identify DoR. Ulrich et al., (2017) used a question from the Diagnostic Interview Schedule (DIS; Robins et al., 1981) which asked: have you ever had messages sent just to you through TV or radio? This question was repeated across five times points. Participants' answers were given a score of either: yes (possible or definite delusional beliefs were present); or no (overvalued ideas were present, not delusional beliefs). Ben-Zeev et al., (2012) used the following experience sampling method (ESM) question: “Since the last questionnaire, have you felt that someone could communicate with you through the television or radio?”. Participants who answered yes were considered to have DoR. Finally, Hartley et al., (2012) conducted the Positive and Negative Syndrome Scale (PANSS; Kay et al., 1987) with participants. The PANSS has poor to good internal consistency (positive scale: α=.72; negative scale α=.80; general psychopathology scale α=.56 in a schizophrenia sample; Peralta & Cuesta, 1994). Researchers used the delusion and auditory hallucination content coding manual (DAHC-MAN; Hartley et al., 2009) to code the PANSS assessment and identify people with DoR.

Emotion Measures

Anxiety

Eight papers measured anxiety (Ben-Zeev et al., 2012; Hartley et al., 2012; Meyer & Lenzenweger, 2009; Morrison & Cohen 2014; Preti et al., 2019; Rodriguez-Testal et al., 2019; Senin-Calderon et al., 2017; & Unterrassner et al., 2017). One study (Ben-Zeev et al., 2012) used the Beck Anxiety Inventory (BAI; Beck et al., 1988) which has 21 items that measure general anxiety. Higher scores indicated higher anxiety. Meyer & Lenzenweger, (2009) used the state-trait anxiety inventory (STAI; Spielberg, 1989) which has 20 items and measures trait and state anxiety. Higher scores indicated higher anxiety. Two studies (Rodriquez-Testal et al., 2019; & Senin-Calderon et al., 2017) used the General Health Questionnaire-28 (GHQ-28; Goldberg et al., 1979). This measure has 28 items, seven of which measure general anxiety. Higher scores on the anxiety questions indicated higher anxiety. Morrison & Cohen (2014) used the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998). This measure has 20 items that measure social anxiety. Higher scores indicated higher levels of social anxiety. Unterrassner et al., (2017) used the Schizotypal Personality Questionnaire (SPQ; Raine, 1991). One study (Preti et al., 2019) used the SPQ (Raine, 1991). This questionnaire has 74 items modelled on the DSM-III-R criteria for schizotypal personality disorder. It has items related to social anxiety. Scores on the social anxiety items were indicative of the presence of social anxiety. Unterrassner et al., (2017) measured social anxiety and phobic anxiety using the revised Symptom Checklist-90 (SCL-90r; Derogatis et al., 1973). The SCL-90r is a 90-item validated measure which assesses psychological difficulties. Social anxiety was measured through the anxiety subscale. Phobic anxiety was measured through the phobic anxiety subscale. Finally, Hartley et al., (2012) used the PANSS anxiety subscale. This measure has one item that measures anxiety. Higher scores

indicated higher levels of anxiety. All studies had acceptable to excellent internal consistency

in patient or non-patient samples (α= .70 to .97, Beck et al., 1988; Beiling et al., 1998; Gibbons et al., 2003; Mattick & Clarke, 1998; Peralta & Cuesta, 1994; Prinz et al., 2013; Raine, 1991).

Depression

Six papers measured depression (Ben-Zeev et al., 2012; Hartley et al., 2012; Meyer & Lenzenweger, 2009; Rodriguez-Testal et al., 2019; Senin-Calderon et al., 2017; & Unterrassner et al., 2017). Two papers (Ben-Zeev et al., 2012; & Meyer & Lenzenweger, 2009) used Beck's Depression Inventory-II (BDI-II; Beck et al., 1996). The BDI-II has 21 items that measure depression. Higher scores indicate higher levels of depression. Rodriguez-Testal et al., (2019) and Senin-Calderon et al., (2017) used the GHQ-28 which has seven items that measure depression. Higher scores indicated higher distress. Unterrassner et al., (2017) measured depression using the SCL-90r; Derogatis et al., 1973). The SCL-90r is a 90-item validated measure which assesses psychological difficulties. Depression was measured through the depression subscale with higher scores indicating higher levels of depression. Hartley et al., (2012) used the PANSS depression subscale. This measure had one item that measured depression. Higher scores indicated higher levels of depression. All measures had acceptable to excellent internal consistency across patient or non-patient samples (α=.70 to 97, Beck et al., 1996; Gibbons et al., 2003; Peralta & Cuesta, 1994; and Prinz et al., 2013).

Anhedonia

Three papers measured anhedonia (Kollias et al., 2008; Meyer & Lenzenweger, 2009; & Unterrassner et al., 2017). Two studies (Kollias et al., 2008; & Unterrassner et al., 2017) used the Revised Physical Anhedonia Scale (PASr; Chapman et al., 1976). The PASr is a 61-item validated measure of physical anhedonia. Higher scores indicated less ability to experience physical and sensory pleasure. Two studies (Kollias et al., 2008; & Meyer & Lenzenweger, 2009) used the Revised Social Anhedonia Scale (SASr; Chapman et al., 1976).

The SASr is a 40-item validated measure of social anhedonia. Higher scores indicated less ability to experience social and interpersonal pleasure. Both measures had good internal consistency (α =.83 to .87 in samples of students; Chapman et al., 1976).

Self-esteem

Three papers (Ben-Zeev et al., 2012, Warman et al., 2010; & Warman & Lysaker, 2011) measured self-esteem. Ben-Zeev et al., (2012) used the Self-Esteem Rating Scale Short Form (SERS-SF; Lecomte et al., 2006) which is a 20-item-validated measure of self-esteem. Lower scores indicated lower self-esteem. Warman et al., (2010) used the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) which is a 10-item-validated measure of self-esteem. Lower scores indicated low self-esteem. Warman & Lysaker (2011) used the Multidimensional Self-Esteem Inventory (MSEI; O'Brien & Epstein, 1988) which is a 116-item-validated measure of self-esteem. Lower scores indicated lower self-esteem. All three measures had good to excellent internal consistency in non-patient samples (α = .76 to .91; Chabrol et al., 2006; Lecomte et al., 2006).

Self-consciousness

Two papers measured self-consciousness. Rodriguez-Testal et al., (2019) measured public self-consciousness. Senin-Calderon et al., (2017) measured public and private self-consciousness. Both papers used the Revised Self-Consciousness Scale (RSCS; Scheier & Carver, 1985). The RSCS contains 22 items, seven of which measured public self-consciousness and nine of which measured private self-consciousness. Higher scores indicated higher levels of self-consciousness. It has good internal consistency (private self-consciousness: α =.75. Public self-consciousness: α =.84 in a general population sample; Scheier & Carver, 1985).

Shame

Borrelli et al., (2023) measured shame using the Experience of Shame Scale (ESS; Andrew et al., 2002). This is a valid measure of shame which has 25 items. Higher scores indicated higher levels of shame. Its internal consistency was excellent in undergraduate students (α = .92; Andrew et al., 2002).

Negative Affect

Two studies measured negative affect (Borrelli et al., 2023; Meyer & Lenzenweger, 2009). Both studies used The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) a 20-item validated measure of positive and negative affect. Negative affect was measured by 10 items. Higher scores indicated higher levels of negative affect. It has good internal consistency in a general population sample (α = .84 to .87; Crawford & Henry, 2004).

Emotional Instability

Unterrassner et al., (2017) measured emotional instability using the SCL-90r, a 90-item validated measure which assesses psychological difficulties. Emotional instability was measured through the anger-hostility subscale of the SCL-90. Higher scores indicated higher levels of emotional instability. It has acceptable to excellent internal consistency (α = .74 to .97 across subscales in a sample of inpatients; Prinz et al., 2013).

Threat

León-Palacios et al., (2019) measured threat using the Early Life Experience Scale (ELES; Gilbert et al., 2003). This validated measure contains 15 items that measure early life experiences across three subscales (threat, submissiveness and undervalued). In total six items measured threat. Higher scores on the threat subscale indicated higher levels of threat.

It has excellent internal consistency (α =.92 in a sample of undergraduates; Gilbert et al., 2003).

Aggression

One study (Nederlof et al., 2014) measured aggression using the Aggression Questionnaire (Buss & Perry, 1992). This is a validated measure of aggression and has 29 items. Higher scores indicated higher levels of aggression. It has good internal consistency (α =.89 in a sample of students; Buss & Perry, 1992).

Anger

One study (Ulrich et al., 2013) measured anger using the MacArthur-Maudsley Assessment of Delusions Schedule (MMADS; Taylor et al., 1994). This is a semi-structured interview that measures cognitive affective and behavioural aspects of delusions. As part of this assessment anger is measured. Anger was determined by researchers coding them as absent or present.

Elation measures

One study (Ulrich et al., 2013) measured elation using MMADS (Taylor et al., 1994). This is a semi-structured interview that measures cognitive affective and behavioural aspects of delusions. As part of this assessment elation is measured. Elation was determined by researchers coding them as absent or present.

Main Findings

Anxiety

Six papers explored the association between DoR and general anxiety using cross-sectional designs. Five studies found that DoR was positively, moderately, and significantly associated with anxiety. Two employed mixed patient samples (Rodriguez-Testal et al., 2019, patient group r= 0.125, p<.001, control group r= 0.300, p<.001; Senin-Calderon et al., 2017,

r= .383, p <0.01), one employed a psychosis patient group (Hartley et al., 2012) which reported that anxiety was significantly higher in people with DoR, t(204) = -2.35, p =.020), and two used nonpatient samples (Meyer & Lenzenweger, 2009: trait anxiety r=0.45 and state anxiety r=0.34, p was not specified; Unterrassner et al., 2017, r=0.39, p<.000).

In terms of anxiety predicting DoR longitudinally, Ben-Zeev et al., (2012) did not find an effect (r = .03 (SE=0.08), OR=1.03 [0.89, 1.20], p >.05).

Three studies, all with nonpatient samples, measured social anxiety. Morrison & Cohen (2014) found that social anxiety and DoR were not significantly correlated (r =.12, p=.22). In contrast, two studies found that DoR was positively and significantly correlated with excessive social anxiety (Preti et al.,2019: r=0.35, p<.001; Unterrassner et al., 2017: r= 0.18, p=.01, regression analysis, β= 0.70 [-0.14, 0.19], p=.070).

Unterrassner et al., (2017) measured phobic anxiety and found that it was positively and significantly correlated with DoR (r= 0.33, p< .000, regression analysis, β=0.28 [0.11, 0.44], p<.001).

Overall, studies that used patient samples found an association between DoR and anxiety which was supported by the non-patient studies. The only exception was the patient longitudinal ESM study which did not find an association. Non-patient studies also found mixed support for an association between DoR and social anxiety. Finally, a non-patient study found that phobic anxiety was positively associated with DoR.

Depression

Six papers explored associations between DoR and depression. Five papers found that DoR was associated with depression. Two cross-sectional studies used mixed patient samples (Rodriguez-Testal et al., 2017: patient group r= 0.199, p < .001, control group r= 0.289, p < .001; Hartley et al., 2012: t(204) = -2.28, p = .024). In terms of predicting DoR

longitudinally, Ben-Zeev et al., (2012) found no association between DoR and depression (r = -.05 (SE=0.11) OR=.95 [3.83, 21.86], p >.05).

Three nonpatient cross-sectional studies found significant associations between DoR and depression (Unterrassner et al, 2017: r= 0.39, p< .000, regression analysis (β= 0.20 [0.05, 0.36], p=.012; Senin-Calderon et al., 2017: r= .367, p <0.01, mediation analysis axb = .087, p=.024 [.047 to .1.28], total effect: c = .203, p < .001; and Meyer & Lenzenweger, 2009: r=0.35, no significance reported).

Overall, the cross-sectional patient studies found a significant association between DoR and depression with support from the nonpatient studies. However, the longitudinal ESM study did not find an association.

Self-esteem

Three papers explored associations between DoR and self-esteem. Warman et al., (2010), in their student sample, found a small but significant negative correlation between self-esteem and DoR (r = -0.20, p= .025). However, when examining patients, Warman & Lysaker, (2011) observed a similar but, in this case, a nonsignificant correlation between self-esteem and DoR (r -0.26, p .16), possibly because the sample was small (n = 30). Ben-Zeev et al., (2012), in their ESM study with patients, conducted multi-level modelling and found that low self-esteem positively and significantly predicted the occurrence of DoR (r = .07 (SE= 0.02) OR=1.07 [1.04, 1.11] p <. 01). Overall, mixed results were found. Although the non-patient study found that DoR was associated with low self-esteem, the two patient studies found opposing results. The longitudinal ESM study found low self-esteem predicted DoR however the cross-sectional patient study did not.

Self-consciousness

Two papers explored the association between DoR and self-consciousness. One used mixed patient samples and a control group (Rodriguez-Testal et al., 2019, patient group: r=

.225, p < .001, control group: r= 0.274, p < .001). The other used a nonpatient sample and found that DoR was associated with self-consciousness (Senin-Calderon et al., 2017, r= .347, p < .01) and mediated the relationship between anxiety and DoR (axb = .025, CI = .009, .045, p= .011). Overall both the patient and nonpatient studies suggested that DoR was associated with self-consciousness. However, there could be a more complex picture regarding self-consciousness as it was shown to mediate a relationship between anxiety and DoR.

Shame

One cross-sectional study found that DoR was positively and significantly correlated with shame in a sample of people with schizophrenia (r=.601, p = .01; Borelli et al., 2023).

Negative Affect

Two cross-sectional studies found that DoR was positively, and significantly correlated with negative affect. One sampled patients with schizophrenia (Borelli et al., 2023, (r= .444, p = 0.1) and the other study used a nonpatient sample (Meyer & Lenzenweger, 2009, r= .46, significance level not provided). Overall both the patient and non-patient study found that DoR was associated with negative affect.

Anhedonia

Three papers explored anhedonia using cross-sectional designs. Two studies found no association between DoR and physical Anhedonia. One sampled patients with schizophrenia (Kollias et al., 2008, r= .138, p = .289), and the other used a nonpatient sample (Unterrassner et al., 2017, r= −.07, p = .292).

Two studies found a significant association between DoR and social anhedonia. One sampled patients with schizophrenia Kollias et al., 2008; r = .253, p = .049) while the other used a nonpatient sample (Meyer and Lenzenweger 2009, r= 0.3, no p-value provided).

Overall the patient cross-sectional studies revealed that DoR was not associated with physical anhedonia but was associated with social anhedonia. This was supported by non-patient studies.

Emotional Instability

One cross-sectional study found a significant association between DoR and emotional instability, which showed that DoR predicted high levels of emotional instability in a sample of people from the general population ($r= 0.29$, $p < .001$; regression analysis: $\beta= 0.25$ [CI= .08, .41], $p=.004$; Unterrassner et al., (2017).

Threat

One patient cross-sectional study found a significant association between DoR and threat, which showed that high levels of threat predicted DoR ($r= .412$, $p < .01$; mediation analysis: $\beta= 0.36$, $SE= 0.04$, $t= 9.44$, CI= 0.29, 0.44, $p < .01$; León-Palacios et al., 2019).

Aggression

One cross-sectional study of students found that DoR was not associated with aggression (specific r value was not reported but fell between $r= .03$ and $r= .13$, $P > .10$; Nederlof et al., 2014).

Anger

One paper conducted a cohort study and found a significant inverse association between DoR and anger with DoR shown to cause anger to decrease in a patient sample (Adjusted odds ratio (AOR) = 0.37, CI= 0.19, 0.74, $p < .05$; Ulrich et al., 2013).

Elation

Only one paper conducted a cohort study on a patient sample and found a significant association between elation and DoR, which showed that DoR caused elation to increase (AOR = 4.74, CI= 2.38, 9.46, $p < .05$; Ulrich et al., 2013).

Study Quality

A summary of the methodological quality of the included studies as rated by two independent reviewers is shown in Table 4. If the quality assessment item was deemed to be adequately met it was given a score of yes. None of the studies adequately met all 14 criteria. The highest number of items adequately met was eight (Preti et al., 2019; Ulrich et al., 2013), whereas the lowest number was four (Hartley et al., 2012; & Nederlof et al., 2014). The rest of the studies adequately met between five and seven items (Ben-Zeev et al., 2012; Borrelli et al., 2023; Kollias et al., 2008; León-Palacios et al., 2019; Meyer & Lenzenweger, 2009; Morrison & Cohen, 2014; Rodriguez-Testal et al., 2019; Senin-Calderon et al., 2017; Ulrich et al., 2013; & Unterrassner et al., 2017).

There was significant variation in the quality of included studies. Increased weight was given to studies that showed higher levels of quality when considering the overall results. In terms of strengths, all 15 studies clearly stated the research question or objective, and all but one study adequately defined their population of interest. Nederlof et al., (2014) were given a score of partially met as further information could have been provided about the participant's demographics, location, and period of collection.

However, there was a lack of validity across the studies. As the majority of the studies used non-experimental or cross-sectional designs, causality between DoR and emotional factors could not be determined. However, the exceptions could be the longitudinal ESM study (Ben-Zeev et al., 2012) and cohort study (Ulrich et al., 2013) which may have provided stronger evidence for a causal relationship, although true causation cannot be determined through any of the study designs. Similarly, only one study (Ulrich et al., 2013), scored adequate for having a time frame sufficient enough to see an association between DoR and emotional factors. This was due to Ulrich et al., (2013) using a cohort design. Having a sufficient time frame would have allowed the other studies to conduct meaningful analyses

and better understand the relationships between their variables. Therefore, the other 14 studies could lack validity in their results. In addition, Morrison & Cohen (2014) was the only study to discuss whether the assessors were blinded. The lack of blinding in the other 14 studies could have increased researcher bias. Interestingly, only two studies (Kollias et al., 2008; Warman et al., 2010) provided an adequate overview of their sample by justifying it based on power, variance, and effect. Three studies received a rating as partial (Meyer & Lenzenweger, 2009; Preti et al., 2019; Senin-Calderon et al., 2017 because although there was some in-depth information and justification given about their samples, they did not discuss power, variance, and effect. A further interesting point was that 11 of the studies demonstrated participation rates of over 50% which reduced the risk of bias. However, two studies (Senin-Calderon et al., 2017; and Unterrassner et al., 2017) did not manage to retain a 50% participation rate, which increased the risk of bias in these studies, as it was thought that the studies may not adequately represent the target population. Further information can be seen in Table 4.

Table 4

Quality Assessment Scores

Author (Year)	Research Question	Population specified and defined	Participation rate above 50%	Recruited from a similar population	Sample size justification, power, variance, and effect	DoR measured prior to the emotional factor	Time frame is sufficient to see an association between DoR and emotional factor	Examine different degree of DoR related to the emotion measures	DoR measures defined, valid and reliable	DoR assessed more than once	Emotion measures defined, valid and reliable	Assessors blinded to DoR status	Loss to follow-up after baseline 20% or less	Confounding variables?
Ben-Zeev et al., (2012)	Y	Y	Y	Y	N	N	N	P	P	Y	Y	N	NA	Y
Borrelli et al., (2023)	Y	Y	Y	Y	N	N	N	N	Y	N	Y	N	NA	N
Hartley et al., (2012)	Y	Y	NR	P	N	N	N	P	P	N	Y	N	NA	Y
Kollias et al., (2008)	Y	Y	Y	Y	Y	N	N	P	Y	N	P	N	NA	Y
León-Palacios et al., (2019)	Y	Y	Y	P	N	N	N	P	Y	N	Y	N	NA	P
Meyer & Lenzenweger (2009)	Y	Y	Y	Y	P	N	N	Y	P	N	P	N	NA	Y
Morrison & Cohen (2014)	Y	Y	Y	Y	N	N	N	N	P	N	Y	Y	NA	N
Nederlof et al., (2014)	Y	P	NR	Y	N	N	N	P	Y	N	Y	NR	NA	N
Preti et al., (2019)	Y	Y	Y	Y	P	N	N	Y	Y	Y	Y	NR	NA	P
Rodriguez-Testal et al., (2019)	Y	Y	Y	Y	N	N	N	N	P	N	Y	N	NA	P
Senin-Calderon et al., (2017)	Y	Y	N	Y	P	N	N	P	Y	NA	Y	N	NA	Y
Ulrich et al., (2013)	Y	Y	Y	P	N	Y	Y	P	Y	N	Y	N	N	Y
Unterrassner et al., (2017)	Y	Y	N	P	N	N	N	N	Y	N	Y	N	NA	Y
Warman et al., (2010)	Y	Y	Y	Y	Y	N	N	P	Y	N	P	N	NA	P
Warman & Lysaker, (2011)	Y	Y	Y	Y	N	N	N	Y	Y	N	Y	N	NA	Y

Note. DoR = delusions of reference; Y = yes, adequately met; N=No, not adequately met; P= partially met; NR = not reported; NA = not applicable

Discussion

The current systematic review aimed to answer the following research question: *what emotional factors are associated with DoR?* Only 15 papers, published between 2008 and 2023 met the inclusion criteria, despite the search initially generating high volumes of papers. Although the review identified several emotions associated with DoR, it should be noted that the included studies were found to be of low quality across their design, sample, and results and demonstrated a risk of bias. Overall, this study highlighted that emotional factors in DoR have not been a focus of adequate research and given the lack of quality the results should be interpreted with caution.

In total, 15 emotional factors were found. Initially, patient studies agreed that seven emotions were associated with DoR (elation, threat, emotional instability, social anhedonia, negative affect, shame, and self-consciousness) and that two emotions (anger and physical anhedonia) were not. This was supported by non-patient studies, which also identified that phobic anxiety, may also be linked to DoR and aggression may not. Despite these findings, some studies yielded mixed results. A longitudinal study (Ben-Zeev et al., 2012) found no association for DoR and depression or anxiety. Although this study was found to be of better quality, the other studies had larger numbers of participants and were in support of an association between DoR and anxiety, and DoR and depression. Due to this, it was felt that DoR is more likely to be associated with anxiety and depression. Furthermore, Morrison & Cohen, (2014) found no association between social anxiety and DoR whereas two studies (Preti et al.,2019; Unterrassner et al., 2017) found an association. As the quality assessment revealed that Preti et al., (2019) was of better quality, and two papers had similar results, social anxiety was likely be associated with DoR. Furthermore, one study found that DoR was associated with self-esteem (Warman et al., 2010) however another study found no association (Warman & Lysaker, 2011). Given that Warman & Lysaker (2011) demonstrated

better quality in the quality assessment and conducted their study on a sample of patients with delusional beliefs, it could be concluded that DoR and self-esteem are not associated. Depression and self-awareness were also found to mediate a relationship between anxiety and DoR suggesting a more complex picture regarding DoR and emotion (Senin-Calderon et al., 2017).

The overall consensus was that 11 emotions were associated with DoR (elation, threat, emotional instability, social anhedonia, negative affect, shame, self-consciousness, phobic anxiety, anxiety, depression, and social anxiety) and 4 emotions were not (anger, aggression, self-esteem and physical anhedonia). The results provided some evidence that emotion could play a key role in the development and maintenance of delusions (Freeman & Garety, 2003). However, the majority of the studies were low in quality which has a significant impact on the overall findings. Caution should be taken when considering these results.

The findings supported some of the previous research which suggested that shame, depression, and anxiety were associated with delusions (Campell, 2001; Freeman et al., 2012; Garety et al., 2001; Kramer et al., 2014; Lincoln et al., 2017; Preti & Cella, 2010). Other research found that people with delusions had depression (Campell, 2001), and manic feelings associated with instability (Spizer, 1982). Furthermore, it supported the findings by Gruber et al., (2018) who suggested that anhedonia was enhanced in people with schizophrenia or at risk of psychosis which meant that they were less likely to feel pleasure. However, this review found opposite results to Garety et al., (2001) and Preti & Cella, (2010) who found that anger was a maintaining factor in delusions and Freeman et al., (2012), Kramer et al., (2014) and Lincoln et al., (2017) who found that anxiety contributed to the development of delusions. The mixed findings may be due to some studies focusing on delusions as a whole and not assessing emotional factors by the delusion subtype. This

strengthens the argument that future research should consider which emotional factors contribute to and maintain delusions by delusion subtype.

Overall, these results could tentatively support the theory that emotions directly influence the development of DoR as suggested by Freeman & Garety, (2003). However, they do not support the defence hypothesis (Bentall et al., 1994; Smith et al., 2005) as the three studies on self-esteem found no association between low self-esteem and DoR. Furthermore, as the studies did not aim to answer questions related to these theories or directly link their results back to these theories, it cannot be stated for sure whether the current evidence gained in this review supports either theory.

Strengths and Limitations

Current review

There were several strengths to the study which included pre-registering the review. The study followed PRISMA guidelines which enhanced transparency and reproducibility. In line with the recommended literature, the study searched three databases and included forward and backward searches. These techniques increased the likelihood of retrieving all relevant papers. In addition, two independent reviewers screened papers at all levels, with both reviewers extracting 100% of the data and reviewing 100% of the papers for the quality assessment. This enhanced inter-rater reliability and reduced bias. The study also aimed to include all relevant studies in the review by using the PICOS tool to design the inclusion/exclusion criteria and by being openly inclusive of two papers which included some 17-year-old participants. However, the exclusion criteria could have been overly stringent. The review excluded studies that did not have an English full text and excluded grey literature which could have meant that non-significant results were underrepresented. Furthermore, the study could have included papers which explored emotional factors and

DoR in child populations. This may have provided more evidence about which emotional factors caused DoR. In addition, the inclusion of qualitative research might have yielded stronger more comprehensive findings. These limits could have excluded relevant studies and impacted external validity. The study also included papers that used non-randomised studies which could have affected internal validity. Finally, it could have also benefited from service user involvement in all aspects of the study.

Included studies

The included studies all provided aims and the majority provided a detailed description of the population of interest. However, as discussed previously, the papers lacked quality. The quality assessment identified that the majority of the studies had low levels of validity due to their designs. As most of the studies were cross-sectional, they did not have a sufficient time frame to demonstrate a strong association between DoR and emotional factors. Furthermore, none of the studies were designed to provide absolute proof of a causal relationship between emotional factors and DoR. The highest number of criteria met, as outlined by the quality assessment was eight out of fourteen with only two studies providing information about the power to determine an appropriate sample size. Papers also used a range of standardised and unstandardised measures to identify DoR. As most studies focused on delusions as a whole, and only considered DoR within additional analyses results were often limited to correlations. Given the significant limitations, the results of the review should be considered with caution.

Clinical Implications and Future Recommendations

The review is of theoretical importance as there is still an ongoing debate as to what factors cause and maintain delusional beliefs. It was also thought that this review is of clinical importance as Freeman and Garety (2003) have suggested that understanding the relationship

between emotions and delusions will aid the development of effective treatments and that treating the emotion could reduce the positive symptom, aiding recovery. However, given the scarcity of research, further research is needed.

Future reviews should aim for less stringent inclusion criteria, include papers with both child and adult populations, consider including qualitative research and involve service users within their design. This would enhance validity and reliability and provide a more comprehensive overview of emotional factors in DoR. Where possible, future research into DoR should focus on delusion subtypes and use experimental, randomised or longitudinal approaches. Designs could aim to understand which emotions play a direct role in the development and maintenance of delusions. Furthermore, research should aim to recruit large numbers of participants from at-risk populations and patient populations to enable more robust statistical analysis (group comparisons, multi-level modelling, structural equation modelling) which would help determine whether emotions cause or maintain DoR, by providing strong statistical inferences.

Conclusion

For the first time, this review aimed to understand the emotions and self-related emotional factors associated with DoR. In total 11 emotions were found to be associated with DoR (anxiety, depression, elation, emotional instability, negative affect, phobic anxiety, shame, self-consciousness, social anhedonia, social anxiety, and threat) and four emotions were found not to be associated (anger, aggression, physical anhedonia and self-esteem). However, the evidence base was limited, and the quality assessment highlighted significant issues with reliability and validity. Furthermore, due to the study's methodological differences, it was difficult to integrate the findings and causality could not be established between DoR and emotional factors. Therefore the results should be interpreted with caution. The review highlighted the need for future research in the area of DoR. Understanding

emotional factors further could provide more information about the underlying and maintaining factors associated with DoR, which has important theoretical and clinical implications.

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Appendix A

PRISMA Checklists

PRISMA 2020 for Abstracts Checklist

Section and Topic	Item #	Checklist item	Reported (Yes/No)
TITLE			
Title	1	Identify the report as a systematic review.	Yes
BACKGROUND			
Objectives	2	Provide an explicit statement of the main objective(s) or question(s) the review addresses.	Yes
METHODS			
Eligibility criteria	3	Specify the inclusion and exclusion criteria for the review.	Yes
Information sources	4	Specify the information sources (e.g. databases, registers) used to identify studies and the date when each was last searched.	Yes
Risk of bias	5	Specify the methods used to assess risk of bias in the included studies.	Yes
Synthesis of results	6	Specify the methods used to present and synthesise results.	Yes
RESULTS			
Included studies	7	Give the total number of included studies and participants and summarise relevant characteristics of studies.	Yes
Synthesis of results	8	Present results for main outcomes, preferably indicating the number of included studies and participants for each. If meta-analysis was done, report the summary estimate and confidence/credible interval. If comparing groups, indicate the direction of the effect (i.e. which group is favoured).	Yes
DISCUSSION			
Limitations of evidence	9	Provide a brief summary of the limitations of the evidence included in the review (e.g. study risk of bias, inconsistency and imprecision).	Yes
Interpretation	10	Provide a general interpretation of the results and important implications.	Yes
OTHER			
Funding	11	Specify the primary source of funding for the review.	NA
Registration	12	Provide the register name and registration number.	Yes

PRISMA Main Checklist

Section and Topic	Item #	Checklist item	Location where item is reported
TITLE			
Title	1	Identify the report as a systematic review.	Pg. 6
ABSTRACT			
Abstract	2	See the PRISMA 2020 for Abstracts checklist.	See Appendix A
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of existing knowledge.	Pg.4-6
Objectives	4	Provide an explicit statement of the objective(s) or question(s) the review addresses.	Pg. 6
METHODS			
Eligibility criteria	5	Specify the inclusion and exclusion criteria for the review and how studies were grouped for the syntheses.	Pg. 8
Information sources	6	Specify all databases, registers, websites, organisations, reference lists and other sources searched or consulted to identify studies. Specify the date when each source was last searched or consulted.	Pg. 9
Search strategy	7	Present the full search strategies for all databases, registers and websites, including any filters and limits used.	Pg.9-11
Selection process	8	Specify the methods used to decide whether a study met the inclusion criteria of the review, including how many reviewers screened each record and each report retrieved, whether they worked independently, and if applicable, details of automation tools used in the process.	Pg.10
Data collection process	9	Specify the methods used to collect data from reports, including how many reviewers collected data from each report, whether they worked independently, any processes for obtaining or confirming data from study investigators, and if applicable, details of automation tools used in the process.	Pg. 10-11
Data items	10a	List and define all outcomes for which data were sought. Specify whether all results that were compatible with each outcome domain in each study were sought (e.g. for all measures, time points, analyses), and if not, the methods used to decide which results to collect.	Pg. 11
	10b	List and define all other variables for which data were sought (e.g. participant and intervention characteristics, funding sources). Describe any assumptions made about any missing or unclear information.	Pg. 11
Study risk of bias assessment	11	Specify the methods used to assess risk of bias in the included studies, including details of the tool(s) used, how many reviewers assessed each study and whether they worked independently, and if applicable, details of automation tools used in the process.	Pg. 11-12
Effect measures	12	Specify for each outcome the effect measure(s) (e.g. risk ratio, mean difference) used in the synthesis or presentation of results.	Pg. 11
Synthesis methods	13a	Describe the processes used to decide which studies were eligible for each synthesis (e.g. tabulating the study intervention characteristics and comparing against the planned groups for each synthesis (item #5)).	Pg. 12

Section and Topic	Item #	Checklist item	Location where item is reported
	13b	Describe any methods required to prepare the data for presentation or synthesis, such as handling of missing summary statistics, or data conversions.	Pg. 11-12
	13c	Describe any methods used to tabulate or visually display the results of individual studies and syntheses.	Pg. 13 and 15
	13d	Describe any methods used to synthesize results and provide a rationale for the choice(s). If meta-analysis was performed, describe the model(s), method(s) to identify the presence and extent of statistical heterogeneity, and software package(s) used.	Pg. 12
	13e	Describe any methods used to explore possible causes of heterogeneity among study results (e.g., subgroup analysis, meta-regression).	NA
	13f	Describe any sensitivity analyses conducted to assess robustness of the synthesized results.	NA
Reporting bias assessment	14	Describe any methods used to assess risk of bias due to missing results in a synthesis (arising from reporting biases).	NA
Certainty assessment	15	Describe any methods used to assess certainty (or confidence) in the body of evidence for an outcome.	NA
RESULTS			
Study selection	16a	Describe the results of the search and selection process, from the number of records identified in the search to the number of studies included in the review, ideally using a flow diagram.	Pg.
	16b	Cite studies that might appear to meet the inclusion criteria, but which were excluded, and explain why they were excluded.	NA
Study characteristics	17	Cite each included study and present its characteristics.	Pg. 15-16
Risk of bias in studies	18	Present assessments of risk of bias for each included study.	Pg. 34-37
Results of individual studies	19	For all outcomes, present, for each study: (a) summary statistics for each group (where appropriate) and (b) an effect estimate and its precision (e.g. confidence/credible interval), ideally using structured tables or plots.	Pg. 17-23 and 30-34
Results of syntheses	20a	For each synthesis, briefly summarise the characteristics and risk of bias among contributing studies.	Pg. 34-37
	20b	Present results of all statistical syntheses conducted. If meta-analysis was done, present for each the summary estimate and its precision (e.g. confidence/credible interval) and measures of statistical heterogeneity. If comparing groups, describe the direction of the effect.	NA
	20c	Present results of all investigations of possible causes of heterogeneity among study results.	NA
	20d	Present results of all sensitivity analyses conducted to assess the robustness of the synthesized results.	NA
Reporting biases	21	Present assessments of risk of bias due to missing results (arising from reporting biases) for each synthesis assessed.	NA
Certainty of evidence	22	Present assessments of certainty (or confidence) in the body of evidence for each outcome assessed.	Pg.
DISCUSSION			

Section and Topic	Item #	Checklist item	Location where item is reported
Discussion	23a	Provide a general interpretation of the results in the context of other evidence.	Pg. 39
	23b	Discuss any limitations of the evidence included in the review.	Pg. 40-41
	23c	Discuss any limitations of the review processes used.	Pg. 40-41
	23d	Discuss the implications of the results for practice, policy, and future research.	Pg. 41-42
OTHER INFORMATION			
Registration and protocol	24a	Provide registration information for the review, including register name and registration number, or state that the review was not registered.	Pg. 7
	24b	Indicate where the review protocol can be accessed, or state that a protocol was not prepared.	Pg. 7
	24c	Describe and explain any amendments to information provided at registration or in the protocol.	Pg. 7
Support	25	Describe sources of financial or non-financial support for the review, and the role of the funders or sponsors in the review.	NA
Competing interests	26	Declare any competing interests of review authors.	NA
Availability of data, code and other materials	27	Report which of the following are publicly available and where they can be found: template data collection forms; data extracted from included studies; data used for all analyses; analytic code; any other materials used in the review.	NA

Appendix B

Quality Assessment Tool

Study Quality Assessment Tools

In 2013, NHLBI developed a set of tailored quality assessment tools to assist reviewers in focusing on concepts that are key to a study's internal validity. The tools were specific to certain study designs and tested for potential flaws in study methods or implementation. Experts used the tools during the systematic evidence review process to update existing clinical guidelines, such as those on cholesterol, blood pressure, and obesity. Their findings are outlined in the following reports:

- Assessing Cardiovascular Risk: Systematic Evidence Review from the Risk Assessment Work Group
- Management of Blood Cholesterol in Adults: Systematic Evidence Review from the Cholesterol Expert Panel
- Management of Blood Pressure in Adults: Systematic Evidence Review from the Blood Pressure Expert Panel
- Managing Overweight and Obesity in Adults: Systematic Evidence Review from the Obesity Expert Panel

While these tools have not been independently published and would not be considered standardized, they may be useful to the research community. These reports describe how experts used the tools for the project. Researchers may want to use the tools for their own projects; however, they would need to determine their own parameters for making judgements. Details about the design and application of the tools are included in Appendix A of the reports.

Quality Assessment Tool for Observational Cohort and Cross-Sectional Studies

Criteria	Yes	No	Other (CD, NR, NA)*
1. Was the research question or objective in this paper clearly stated?			
2. Was the study population clearly specified and defined?			
3. Was the participation rate of eligible persons at least 50%?			
4. Were all the subjects selected or recruited from the same or similar populations (including the same time period)? Were inclusion and exclusion criteria for being in the study prespecified and applied uniformly to all participants?			
5. Was a sample size justification, power description, or variance and effect estimates provided?			
6. For the analyses in this paper, were the exposure(s) of interest measured prior to the outcome(s) being measured?			
7. Was the timeframe sufficient so that one could reasonably expect to see an association between exposure and outcome if it existed?			
8. For exposures that can vary in amount or level, did the study examine different levels of the exposure as related to the outcome (e.g., categories of exposure, or exposure measured as continuous variable)?			
9. Were the exposure measures (independent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			
10. Was the exposure(s) assessed more than once over time?			
11. Were the outcome measures (dependent variables) clearly defined, valid, reliable, and implemented consistently across all study participants?			
12. Were the outcome assessors blinded to the exposure status of participants?			
13. Was loss to follow-up after baseline 20% or less?			
14. Were key potential confounding variables measured and adjusted statistically for their impact on the relationship between exposure(s) and outcome(s)?			

Section Two: Empirical Project

Reality Sharing in People with Delusional Beliefs: A Cross-Sectional Experimental Study Exploring One Aspect of Coalitional Cognition

Abstract

Aims

Coalitional cognition is the set of cognitive abilities that help us navigate complex social environments. It is a new area of exploration in delusional beliefs. One aspect of coalitional cognition is reality sharing, which requires people to share their beliefs with others and agree about reality. This study explored two novel aspects of reality sharing in people living with delusional beliefs: belief sharing and judgements of similarity. As part of this, social networks were explored.

Method

A cross-sectional experimental study was conducted to measure between-group differences. Participants (n=66) were recruited to three groups: a delusional belief group, a mental health control group, or a general population control group (22 per group). Participants took part in a screening phase to determine eligibility and an experimental phase. A series of ANOVAs, MANOVAs and Chi-square tests explored between-group differences.

Results

People with delusions had impairments in belief sharing and tentative results were found for impairments in judgements of similarity. Furthermore, against expectations, people with delusions had larger social networks.

Conclusion

The findings suggest that there is some evidence that people with delusions have impairments in reality sharing. Future research is required to confirm the accuracy of the results and to explore other novel areas of coalitional cognition. Understanding more about coalitional cognition could open a novel avenue for understanding how delusional beliefs are formed and maintained.

Practitioner Points

- This novel project explored reality sharing, a part of coalitional cognition,
- The findings suggested that reality sharing could be impaired in people with delusions.
- People with delusions may find it difficult to share their beliefs with others and judge who is similar to them, which could impact their ability to cooperate with others on important goals.
- The findings could support the design and delivery of novel psychological interventions or support the identification of at-risk populations. However, the results need to be confirmed in larger, higher-powered studies.

Keywords: Delusion; Psychosis; Coalitional Cognition; Reality Sharing

Introduction

Delusions have been defined as “fixed beliefs that are not amenable to change in light of conflicting evidence” (American Psychiatric Association, 2013). Historical approaches have conceptualised delusions as “pathological beliefs characterised by irrationality” (Bayne, 2017; Sakakibara, 2016) and consequently research into the cognitive theory of delusions has emphasised impairments of affect (Garety & Freeman, 1999), metacognitive representation (Bronstein et al., 2019), and perception and reasoning (Langdon & Coltheart, 2000). However, beliefs are typically formed in the context of social relations and a striking feature of delusions is that they are not shared – they are idiosyncratic - suggesting that processes involved in coordinating beliefs with others' social environment may be impaired (De Sousa et al., 2018). Bell et al., (2021) and Bentall, (2023; 2024) have argued that it is important to move away from a focus on reasoning in patients with delusions, and instead focus on coalitional cognition defined as “*the set of cognitive abilities that help us navigate complex social environments comprised of kin and non-kin*” (Raihani & Bell, 2019).

Coalitional Cognition

Coalitional cognition involves distinct cognitive processes that people engage in when forming, participating in, or interacting with groups. These processes are used to understand, predict, and influence the behaviour of others within the group, as well as detect social threats and monitor our position within a coalition (Boyer et al., 2015). The concept derives from research on coalition formation, which has shown that humans behave and think in groups to achieve goals, such as defending against threats, obtaining resources, or when competing for social status.

Several theories exploring human interaction within groups have centred on processes associated with categorisation, and social dynamics. Social identity theory (Tajfel et al., 1979) has stated that individuals categorise themselves and others into social groups, based on their self-concept and social identity. Group members seek to enhance the status of their ingroup compared to their outgroups. Furthermore, the minimal groups paradigm (Tajfel 1971) has demonstrated that, even in the absence of competition for resources, individuals exhibit ingroup discrimination, suggesting that social categorisation and group identification shape human behaviour and relationships. Homan's theory has similarly suggested that individuals form groups to share activities and interact to achieve group-orientated goals (Homans, 1993).

However, these theories have their shortcomings, as social categories are not fixed entities. Categories can be influenced by many factors. For example, when individuals move social classes or occupational groups it can alter their social identity (Manstead, 2018; Hogg et al., 2017). Furthermore, changes to cultural norms can create shifts in how people categorise themselves and others into social groups as when Italian immigrants to the USA began to identify as part of the white majority (Zárate et al., 2019). Other influences such as political and legal changes, globalisation and migration, media and technology, and political and legal changes also cause fluidity within social categories (Arias, 2018; Best, 2016). These factors may lead to changes in allegiances and group-directed goals (Moya & Scelza, 2015). If the research goal is to make generalised predictions about how people function in groups, Cikara (2021) recommends focusing on the context or psychological interdependencies that cause collections of individuals to form coalitions.

One important factor in coalitional cognition is cooperation - the ability to identify those capable and willing to cooperate on important tasks. Cooperation is important when a person's goal cannot be achieved alone (Curioni et al., 2022). In these situations, an

individual will use judgments of similarity to identify whom to share their beliefs with or ask for help. In the absence of unambiguous category labels (e.g., “male”, or “female”) humans observe whether an individual shares similar values, goals, beliefs, and preferences, for example asking, “Did that person make the same choice that I would make” (Cikara, 2021).

Two factors that can impact cooperation are trust and threat. People are more likely to trust those whom they perceive as similar to themselves, as they may perceive them as more likely to act in the coalition's best interest and coordinate their efforts towards the common goal (Boyer et al., 2015; Greenburgh et al., 2022). Furthermore, real, or perceived threats have influenced coalitional formation. When people feel threatened by someone, they may perceive them as more likely to act in ways that are harmful to the coalition (Cikara, 2021; Greenburgh et al., 2022). Humans compute a constantly updated coalitional safety index by monitoring and integrating threat and safety cues in the environment (Boyer et al., 2015). To conclude, cooperation, including judgements of similarity to self, trust and threat are important factors when forming coalitions with others.

A second important factor in coalitional cognition is reality sharing, which requires people within a group to share their beliefs and agree about the nature of reality. As one of the most distinctive characteristics of delusions is that they are not shared with others, it seems likely that this process is somehow disrupted in people who develop pathological beliefs (Bentall, 2023, 2024). Reality sharing presumably depends on the availability of a suitable social group and, in the context of delusions, it is notable that paranoid symptoms are associated with social isolation (Butter et al., 2017; Ryan et al., 2022; Savage et al., 2018). Reality sharing, seen as an essential element in coalition formation (Cikara, 2021), can lay the foundation for cooperation and facilitate effective negotiations and collective problem-solving (Van Ginkel & Van Knippenberg, 2008). Trust is a critical component of successful social interactions (Haselhuhn et al., 2010). However, people with delusions have been found

to lack trust (Freeman, 2016) and have higher levels of threat perception towards others (Dudley & Over, 2003).

Reality Sharing in Delusional Beliefs

Coalitional cognition is plausibly related to delusional thinking in two distinct ways.

(1) First, delusional beliefs, and paranoia specifically, may be related to difficulties in identifying coalition partners, and therefore misperceive threats. Boyer et al. (2015) have argued that humans compute a constantly updated coalitional safety index by monitoring and integrating threat and safety cues in the environment. In an attempt to test this model in a large epidemiological sample, Greenburgh et al., (2021) found that subclinical paranoia was closely associated with perceived threat cues from individuals' immediate social group.

(2) An equally interesting possibility, which is the focus of this study, is that a specific failure in reality sharing may explain the idiosyncratic nature of delusions in general, which distinguishes clinical levels of paranoia from subclinical variants (Bentall, 2023; 2024). Hence, deluded patients may be unable to establish a shared reality with those around them, either because they lack the ability to understand when the beliefs of others are concordant or different to their own or because they do not use coalitions to test out their beliefs by sharing their reality with others. No previous research has directly tested these hypotheses.

Purpose of this study

For the first time, this study will attempt to measure two aspects of reality sharing in people with delusions: judgements of similarity and belief sharing.

As reality sharing depends on the existence of a social group this study will aim to establish participants' social networks using Cohen's Social Network Index (CSNI; Cohen et

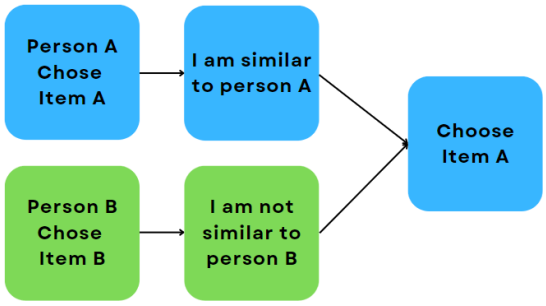
al., 1997) which has been used in previous psychosis (Ryan et al., 2022), and paranoia (Savage et al., 2018) research.

Secondly, reality sharing will be explored through a second novel task; the Belief Exploration Task (BET). Participants will be shown three sets of statements (a) neutral beliefs; (b) common delusional themes; (c) common conspiracy theories, and will be asked to rate their plausibility, whether others would judge the beliefs are plausible, and whether they would be willing to discuss these beliefs with others they know.

Finally, the study adopted a procedure by Lau et al., (2018), who found that participants judged a person as more competent and likeable if a computational model showed them to align with their political views. This concept has been adopted in the current study to develop the AB game which attempts to explore whether participants can judge who is similar to them and cooperate with them to achieve a goal. See Figure 1.

Figure 1

Cooperation with person A



See the methods section for further information on these measures.

Hypotheses

Based on the literature review, the following hypotheses were developed.

1) Reality sharing presumably depends on the existence of a social group. Hence, individuals who have impoverished social relationships will not be able to reality share, or at least will be able to achieve this less effectively. The study hypothesised (H1) that people with delusions will have smaller social networks than the two control groups.

2) Reality sharing requires individuals to negotiate shared beliefs with network members. Hence, the BET asked participants about their belief plausibility, whether others would judge their beliefs are plausible, and whether they would be willing to discuss these beliefs with others they know. The study tentatively hypothesised that people with delusions will make higher plausibility ratings, especially for paranoid beliefs (H2); they will estimate that others would give higher ratings of plausibility, especially for paranoid beliefs; that is, they will not realise that other people judge these beliefs as implausible (H3); they will be less willing to discuss their beliefs with others compared to the control groups (H4).

3) A key concept of coalitional cognition is using cooperation through judgement of similarity to self. It was tentatively hypothesised that people with delusional beliefs will not judge which people are similar to them, which will impact cooperation compared to the control groups (H5).

Method

Design

The Strengthening of the Reporting of Observational Studies in Epidemiology (STROBE; Cuschieri, 2019) guidelines were used when reporting this study (Appendix A).

A cross-sectional experimental design was used to test preliminary hypotheses about group differences. Between December 2023 and May 2024, participants completed self-report questionnaires, and experimental tests across two research phases. Phase one screened

participants for their eligibility and assignment to one of three groups: delusion group (Del) mental health group (MH) or general population group (GEN). Phase two was the experimental phase.

The study was conducted as part of a larger project on delusions. The author (Jessica Twigg, Trainee Clinical Psychologist) focused on belief sharing and alignment; her collaborator Daisy Fitzpatrick (also a Trainee Clinical Psychologist) studied certainty judgments. NHS ethics and data collection were completed together but each collected separate datasets related to their specific hypotheses (see Appendix B for furthermore information on the shared and unshared aspects of the project).

Ethical Approval

On the 10th of November 2023, the study received ethical approval from the National Health Service (NHS) Wales Research Ethics Committee six (ethics reference: 23/WA/0271; project ID: 325034; Appendix C). No changes were made following ethical approval.

Participants

Eligibility Criteria

The study included individuals who were 18 and over who could opt into the study and speak fluent English. Assignment to each group (DEL, MH or GEN) was based on the inclusion and exclusion criteria shown in Table 1.

Table 1

Participant Inclusion and Exclusion Criteria.

Group	Inclusion	Exclusion
All Groups	Capacity to consent to the study	Unable to consent to the study
	Able to read in English	Unable to write in English
	18 years old and above	Under 18 years of age
Delusional Beliefs Group	Schizophrenia spectrum disorder diagnosis or PDI-21 score 8 and above	Affective psychosis (bipolar disorder or major depression)
		PDI-21 score of 7 and below
	Confirmed delusions by a score of 3 or greater on the P1 subscale of the PANSS.	A score of 1 or 2 on P1 of PANSS.
Mental Health Control Group	No schizophrenia spectrum disorder diagnosis	Schizophrenia spectrum disorder diagnosis
	Above clinical cut-off for either: anxiety (GAD-7 score 8 and above) or depression (PHQ-9 score 10 and above)	Below the clinical cut off for either: anxiety (GAD-7 score 8 and above) or depression (PHQ-9 score 10 and above)
	PDI-21 score 7 and below	PDI-21 score 8 and above
General population Control Group	No Psychosis Spectrum Disorder	Psychosis Spectrum Disorder
	Below clinical cut-off for either: Anxiety (GAD-7 score 8 and above) or depression (PHQ-9 score10 and above)	Above clinical cut-off for either: anxiety (GAD-7 score 8 and above) or depression (PHQ-9 score 10 and above)
		Receiving treatment for depression and anxiety
	PDI-21 score 7 and below	PDI-21 score 8 and above

Note: GAD-7 = General Anxiety Disorder 7; PHQ-9 = Patient Health Questionnaire 9; PANSS = Positive and Negative Syndrome Scale; PDI-21 = Peter's Delusion Inventory 21.

Recruitment

Opportunity sampling was used between December 2023 and May 2024 to recruit participants. The researchers gained ethical approval to recruit through mental health services within the NHS, through third-sector organisations, and online social media platforms.

Two NHS trusts initially supported recruitment. However, one trust withdrew support in January 2024. With permission, relevant NHS teams were contacted via email (Appendix E). The researchers liaised with clinicians who provided potential participants with a leaflet which contained a Quick Response (QR) code and a link to phase one (Appendix F). Seven third-sector organisations were contacted via email (Appendix E) to support recruitment. One organisation advertised the study by publishing a leaflet (appendix F) in their monthly newsletter. Three social media networks: Twitter, Facebook, and Reddit were used to advertise the study. The leaflets (Appendix F) were posted in UK-based support groups and subreddits (forums dedicated to specific topics).

Power

A priori power was calculated using G*power and determined that a minimum sample size of 84 was required (see Appendix D). Given the newness of tests and anticipated difficulties with recruitment, the research team aimed to collect as many people as possible.

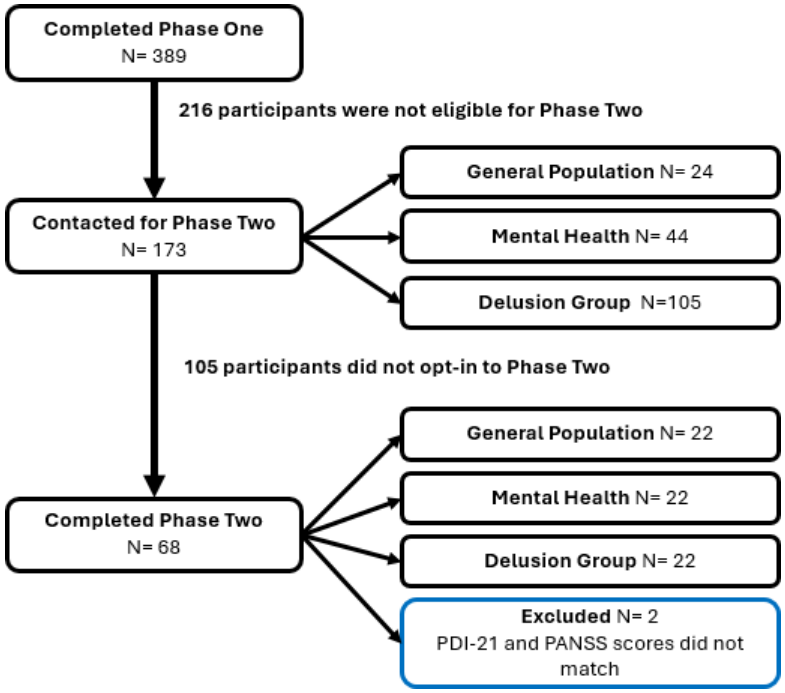
Post-hoc power was calculated for each statistical test using G*Power. The study was underpowered for all measures of social network, neutral consensus measured as part of the belief exploration task, for all measures of judgements of similarity, and three variables on the additional analyses (neutral threat, conspiracy threat and conspiracy trust; see Appendix D).

Sample size

A total of 389 participants completed phase one. Of this, 173 participants (24 general population, 44 mental health, 105 delusions) were eligible to take part in phase two and were contacted. A total of 68 participants completed phase two. Two people were excluded from the DEL group due to conflicting PDI-21 and PANSS scores. In total 66 participants (22 in each group) completed the study (see figure 2).

Figure 2

Sample Size Flow Chart



Materials and Measures

Demographic Questionnaire

Participants completed a demographic questionnaire (Appendix G) which asked about gender, age, ethnicity, religion, mental health diagnoses, psychiatric treatment, and psychiatric medication.

PHQ-9 (Kroenke, 2002)

The PHQ-9 (Appendix H) measured participants' level of depression. Participants answered nine questions, measured on a four-point Likert scale (0=not at all, 3=nearly every day). The PHQ-9 is a validated measure of depression in both non-clinical and clinical populations (Martin et al., 2006) and in those with psychosis (Moritz et al., 2017). It is used as screening criteria for access to NHS Talking Therapies. Higher scores indicated higher depression.

GAD-7 (Spitzer, 2006)

The GAD-7 (Appendix I) measured participants' levels of anxiety. Participants answered seven questions, measured on a four-point Likert scale (0=not at all, 3=nearly every day). The GAD-7 is a validated measurement of anxiety in both clinical and non-clinical populations (Lowe et al., 2008; Johnson et al., 2019) and is used in research into delusions (Freeman & Garety, 1999). It is used as screening criteria for access to NHS Talking Therapies. Higher scores indicated higher anxiety.

PDI-21 (Peters et al., 2004).

The PDI-21 (Appendix J) measured delusional ideation. Participants answered 21 questions by providing a yes/no response. If participants answered yes to a question they were asked three follow-up questions measured on a five-point Likert scale: level of distress (1=not at all distressing, 5=very distressing), level of thought (1=hardly ever think about it, 5=think about it all the time) and level of truth (1=do not believe it is true, 5=believe it is absolutely true). Delusion presence was determined by calculating the number of yes responses. Higher scores indicated higher presence. Delusion distress was calculated by summing the Likert scale scores of distress, pre-occupation, and truth. Higher scores indicated higher distress. The PDI-21 is a validated measure of delusional ideation across clinical and non-clinical populations (Peters et al., 2004; Jones & Fernyhough, 2007).

PANSS (Kay et al., 1987)

The PANSS (Appendix K) is a gold standard assessment (Opler et al., 2017) that measures the presence of positive and negative symptoms in people with schizophrenia spectrum disorders. The structured clinical interview was adapted and supported the administration of the PANSS (SCI-PANSS). The SCI-PANSS measured three positive symptoms linked to delusional ideation: delusions (P1), grandiosity (P5) and suspiciousness (P6). Each researcher underwent training on the administration and scoring of the PANSS to ensure a standardised level of reliability. A score of three or more on the P1subscale was required for allocation to the DEL.

Cohen's Social Network Index (CSNI; Cohen et al., 1997).

The CSNI (Appendix L) measured social networks. Participants answered questions about their network size, diversity, and embedded networks. Network size was determined by calculating the total number of people participants regularly contacted across 12 roles (spouse, parent, child, child-in-law, close relative, close friend, church member, student, employee, neighbour, volunteer, and other group member). Network diversity is the number of social roles in which they had regular contact with at least one person across the 12 roles. If a participant has the role, they are assigned a score of 1; if not they are assigned a score of 0. Summed scores provided the total network diversity score. Embedded networks are the number of network domains a participant is involved in. There are eight network domains (family, friends, school, work, neighbours, church/temple, volunteering, and other groups). A participant must report four people they are in high contact with (contacting them at least once every two weeks) to score a point for a domain. For the family group only, participants scored a point if they reported three people they were in contact with. Summed scores provided the total embedded network score.

Belief Exploration Task (BET)

To assess belief sharing, the novel belief exploration task (Appendix N) was developed using Qualtrics software. Participants were shown a list of beliefs: five commonly held beliefs (e.g.., the sun is a ball of gas; see piloting section), five delusional beliefs taken from the revised paranoid thoughts scale (R-GPTS; Freeman et al.,2021; e.g. people laugh at me behind my back) and five conspiracy theories (e.g. COVID-19 vaccinations are being used to shorten people's lives generated from the literature). For each belief, participants were asked about:

- Belief plausibility: How likely do you think the belief is true? (measured on a 1-7 Likert scale; higher scores indicated higher belief plausibility)
- Others' beliefs: How likely is it that others in your close circle will agree with you? (measured on a 1-7 Likert scale; higher scores indicated higher levels of belief that others would agree with them)
- Sharing beliefs: How comfortable would you feel talking about this belief with others? (measured on a 1-7 Likert scale; higher scores indicated that participants were more likely to share their beliefs with others)

At the end of each section (neutral, conspiracy and paranoid) participants were asked two questions: (1) How threatened would you feel sharing these beliefs with others? and (2) Rate your level of trust in sharing these beliefs with others. Both questions were measured on a 7-point Likert scale with higher scores indicating higher levels of threat and trust).

AB Game

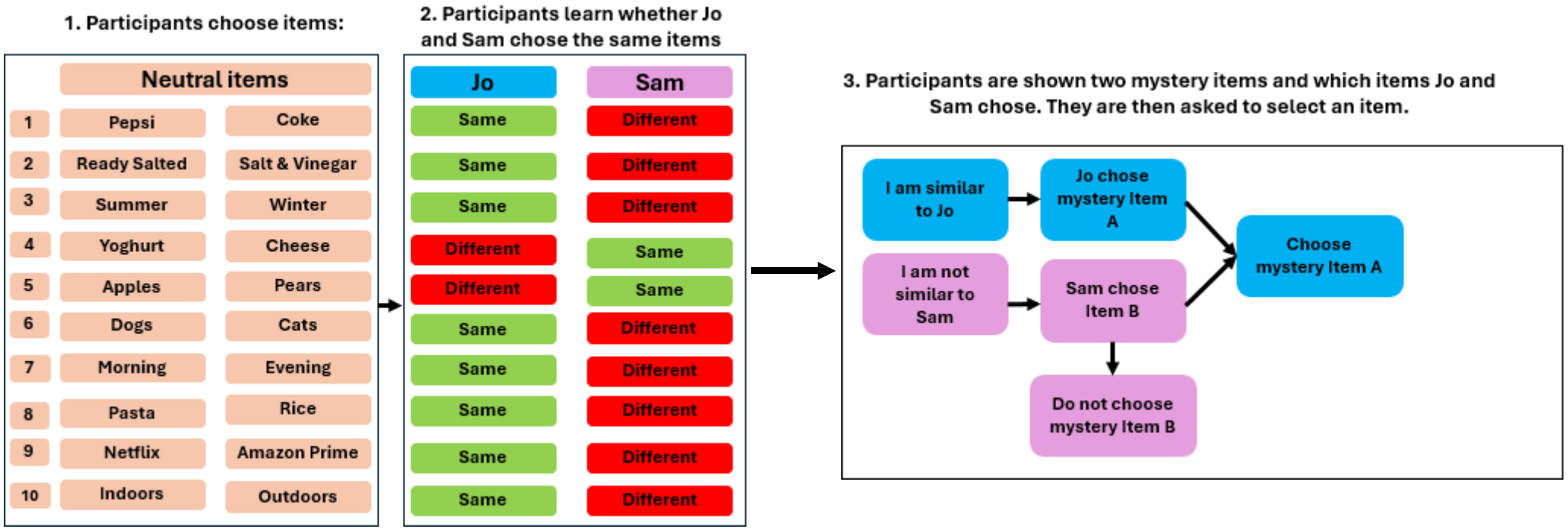
To measure cooperation through judgments of similarity to self, a game (Appendix M) was adapted from Lau et al., (2018) and created in Qualtrics. To begin with, participants were shown 10 items that contained two neutral pictures. They were asked to choose their

preferred item (i.e., “Do you prefer Pepsi or Coke?”). After each item, participants learned the preferences of two people, person A (Jo) and person B (Sam) and participants were shown whether they agreed with the participant. Agreements were highlighted in green and disagreements were highlighted in red. To ensure participants were paying attention to who agreed with them, they were then asked the following question “Who agreed with you? Jo or Sam?”. At the end of the 10 questions, participants saw how frequently Jo and Sam agreed with them. The game always showed that Jo chose 80% of the same answers as the participant and that Sam chose 20% of the same answers. Participants were then shown two items, mystery item A or B. The task then showed that Jo chose item A and Sam chose item B and asked participants to select an item of their choice. If participants observed that Jo made similar choices to them, they should make the same choice as Jo, as this would increase the likelihood that the participant would get an item they liked. This task was repeated three more times using ten sets of questions.

As threat and trust can influence judgements of similarity, individuals rated their trust and threat towards each person before and after each section of the AB game. Both ratings were measured on a seven-point Likert scale (1-7). Higher scores indicated higher levels of threat and trust.

Figure 3.

An Example of the AB Game and How Individuals Might Select Mystery Items Based on Judgements of Similarity



Piloting

Before conducting the study, the researchers piloted materials and measures.

AB Game

To ensure people judged others as similar or not, the level of agreeableness needed to be determined. The researchers asked 20 individuals two questions: (1) *Would you rate a person who agrees with you 80% of the time as agreeable?* (2) *Would you rate a person who agrees with you 20% of the time as not agreeable?* In total 18/20 participants answered yes to both questions. Therefore to allow participants to learn which person (A or B) agreed with them, one person was shown to agree 80% of the time and the other 20% of the time. The full game was piloted with 20 people. Individuals provided feedback and the game was adapted in response.

BET

To determine five beliefs that were commonly held among people in the general population, the researchers asked 20 participants to rate 15 commonly held neutral beliefs on a 7-point Likert scale. The top 5 beliefs were included in the main study. Items related to conspiracy theories were taken from the literature and items related to delusions were taken from the R-GPTS. The game was developed in Qualtrics and piloted with 20 people. Individuals provided feedback and the game was adapted in response.

Phase One and Two

Due to the novelty of the measures used, phases one and two were piloted with ten volunteers. The games were adapted in response to feedback. Both phases were then piloted by two individuals with lived experience. Any errors, mistakes or inaccessibility of language were adjusted.

Patient Public Involvement

Recruitment materials were discussed with a clinician working with psychosis. The clinician fed back about the use of diagnostically led language which was rectified in an email sent to local teams. The clinician queried whether it was possible to widen the inclusion criteria to include people who may be experiencing symptoms of psychosis. To do this the researchers agreed to use scores of 8 and above on the PDI-21 or a diagnosis, to recruit people to the DEL.

Both phases were completed with two people with lived experience. Following completion of the study, the research team plan to share their findings with participants and invite feedback. This will be used to guide publications.

Procedure

Following recruitment participants accessed phase one on Qualtrics, by scanning the QR code or accessing the link provided on the leaflets. Participants read a phase one participant information sheet and provided informed consent (Appendix O). They then provided contact details if they wished to participate in phase two. The researchers provided contact details in case participants had questions related to the study. Participants completed six questionnaires (Demographic questionnaire, PDI-21, GAD-7, PHQ-9, CJQ, MDBS; see Appendix P for test order). All participants who completed phase one were entered into a prize draw to win one of several £20 Amazon vouchers.

Participants who were eligible and had consented were contacted regarding phase two. The researchers met with participants on Google Meets. Participants accessed a Qualtrics link and completed a phase two information sheet and consent form (Appendix Q). The researchers conducted a clinical interview using the SCI-PANSS to confirm eligibility. To reduce bias, the researchers completed 30% of the interviews together. The interviews

were independently scored before the researchers discussed their answers. The score consensus was 100%. Those eligible were asked to continue on the Qualtrics link by selecting option A. Those not eligible were asked to select option B which ended the survey. Eligible participants completed one survey (CSNI) and three games (AB game, BET and RT quiz; see Appendix P for test order). All participants (eligible or not) were debriefed and compensated for their time by receiving a £10 Amazon voucher. All data was stored securely in Qualtrics.

Other Considerations

The study used clinical tools to assess delusional beliefs, anxiety, and depression, asked participants to discuss their beliefs, answer threat-based questions, and rate trust and threats towards others. This could have caused distress. Participants were informed of these factors before taking part and were reminded of their right to withdraw. If participants became distressed, the researchers contacted their supervisor with permission from the participant, reminded participants of their right to withdraw, provided a debrief and signposted to support services (e.g., their GP, Peer Talk or Samaritans); however, no distress was seen. Due to the potential that participants could experience distress, voucher rewards were offered for participation. Participants who opted in to receive a voucher provided their email address. To preserve anonymity, a password-protected file was used to store voucher data and deleted once the study was completed.

Data Analyses

All data collected as part of this study was stored in encrypted password-protected files. Only the researchers and their supervisor could access these files. Before the analyses, data was transferred to a locked Excel spreadsheet, anonymised, and cleaned (Osborne, 2012). The data contained no duplicates, was accurate, non-corrupt, and correctly formatted. All data was present. Data was analysed on SPSS version 29.

Descriptive Statistics

Means and standard deviations were calculated by group type for continuous variables (i.e., age, anxiety, depression etc.). For categorical variables (i.e., gender, religion, ethnicity), frequencies were calculated.

Sample Characteristics and Screening Variables

Several one-way ANOVAs and Chi-square tests with post-hoc testing were calculated to assess for group differences in sample characteristics.

Main Analyses

Social network. Three one-way ANOVAs were conducted to assess for group differences in social network size, social diversity, and number of embedded networks.

Belief sharing. A one-way MANOVA was conducted to explore whether belief plausibility differed by belief type (neutral paranoid or conspiracy) and by group type (DEL, MH or GEN). Following significant results, univariate analyses were conducted to see which dependent variables contributed to the significant result.

Secondly, to determine belief consensus, scores were calculated by subtracting plausibility to others from plausibility to self-ratings for each of the belief types. A score of zero reflected perceived consensus (the participant thinks that others share their beliefs), a positive score indicated the belief is more plausible to self than others, and a negative score indicated that the belief is less plausible to self than others. Once the consensus variables were developed, three one-way ANOVAs with post-hoc testing were conducted to assess for group differences.

Finally, a one-way MANOVA was conducted to explore whether willingness to share a belief with others (belief sharing) differed by belief type (neutral paranoid or conspiracy) and by group type. Following significant results, univariate analyses were conducted to see which dependent variables contributed to the significant result.

Judgements of Similarity. To assess whether people cooperated with a person who was similar to them, five chi-square tests were conducted across each belief type (neutral, paranoid, conspiracy, political) and all belief types combined.

Additional Analyses

Six one-way ANOVAs with post-hoc testing were used to measure group differences in people's level of threat and trust in sharing, neutral, conspiracy, and paranoid beliefs with others as part of the BET task.

Assumption Testing

Assumption testing was conducted for each statistical analysis (see Appendix S).

Results

Demographics

A total of 66 people participated in the study (DEL n=22, MH, n=22, GEN n=22). The total sample mean age was 32.21 (SD=9.60). More people identified as female (66.60%), White British (72.73%) and had no religion (36.36%). There was no statistically significant difference in gender, age, and religiosity between the groups. However, there was a significant difference in ethnicity, diagnosis, treatment, and medication (see Table 2). More of the GEN group identified as White-British, and as expected the DEL and MH groups were more likely to receive a diagnosis, take medication and receive treatment (Appendix R shows SPSS output).

Table 2

Participant Demographics and Group Differences

	Delusion N=22	Mental Health N=22	General population N=22	Group Differences
		Continuous Variable		
Age	M(SD)	M(SD)	M(SD)	
	29.59 (6.80)	33.18 (10.87)	33.86 (10.49)	F(2, 63) =1.27, p = .289.
		Categorical Variables		
	N (%)	N (%)	N (%)	
Gender				
Male	10	9	6	X^2 (4, N= 66) = 3.84, p = .428
Female	12	12	16	
Third Gender	0	1	0	
Ethnicity				
Asian or Asian British	2	0	0	
Black, Black British, Caribbean, or African	10	1	0	X^2 (8, N= 66) = 19.10, p = < .001
Mixed or multiple ethnic groups	0	2	2	
White	10	18	20	
Other	0	1	0	
Religiosity				
Christian	11	6	6	
Buddhist	0	0	1	
Other Religion	2	0	0	
Atheism	1	6	3	X^2 (12, N= 66) = 17.52, p = .131
Agnostic	0	3	2	
No Religion	7	7	10	
Prefer not to say	1	0	0	
Treatment				
Yes	15	14	2	X^2 (2, 66) = 19.10, p = < .001
No	7	8	20	
Diagnosis				
Yes	16	15	0	X^2 (2, 66) = 29.32, p = < .001
No	6	7	22	
Medication				
Yes	10	11	0	X^2 (2, 66) = 15.51, p = < .001
No	12	11	22	

Screening Variables

Significant group differences were found for anxiety, depression, delusion distress score, delusion total score, and the three PANSS items (P1 delusion, P5 grandiosity and P6 suspiciousness; Table 3). The DEL had higher scores than the GEN group for anxiety, depression, delusion distress, delusion presence, and the three PANSS items (P1 delusion, P5 grandiosity, and P6 suspiciousness; $p<.001$). However, scores did not differ between the DEL and the MH group for anxiety ($p=.629$) or depression ($p=.802$). When comparing the MH and GEN groups, no significant differences were found for anxiety ($p=.950$); depression ($p=.735$); delusion distress ($p=.400$); delusion presence ($p=.689$); P1 delusion score ($p=.760$); P5 grandiosity ($p=.872$); and P6 suspiciousness ($p =.749$).

Table 3

Group Differences in Screening Variables

	Delusion M(SD) n=22	Mental health M(SD) n=22	General population M(SD) n=22	Group differences
Anxiety (total GAD-7 score)	9.64 (4.63)	9.95 (3.20)	3.09 (2.11)	Welch's F(2, 38.46) =43.39, p = < .001
Depression (total PHQ-9 score)	10.45 (6.05)	11.64 (6.30)	2.36 (2.40)	Welch's F(2, 34.65) =32.83, p = < .001
Delusion score (total number of yes responses)	10.95 (3.84)	3.55 (1.95)	2.86 (2.01)	Welch's F(2, 39.89) = 39.53, p < .001
Delusion distress level (Total PDI-21 score)	110.82 (56.91)	30.77 (22.07)	16.64 (13.13)	Welch's F(2, 35.68) = 29.53, p < .001
P1 – Delusions (PANSS delusion subscale)	3.68 (.95)	1.27 (.46)	1.14 (.35)	Welch's F(2, 38.43) = 69.88, p < .001
P5 – Grandiosity (PANSS grandiosity total)	2.59 (1.50)	1.18 (.40)	1.05 (.21)	Welch's F(2, 34.34) = 11.81, p < .001
P6- Suspiciousness (PANSS suspiciousness total)	3.36 (1.26)	1.50 (.51)	1.32 (.48)	Welch's F(2, 38.94) =25.231, p < .001

Main Analyses

Social network

Social network scores were decomposed into three variables: network size, network diversity, and embedded networks (Table 4 shows the results). Social network size and network diversity were significantly different between groups. Post-hoc Tukey test revealed a

significant difference between the DEL and GEN groups only, with, against expectation, the DEL showing significantly larger social networks ($p<.05$). and network diversity ($p<.02$). No significant differences between groups were found for the number of embedded networks (the number of network domains such as family, social groups etc. that a participant is involved in). Overall and against expectation, people with delusions appeared to have larger social networks.

Table 4

Social Network Scores

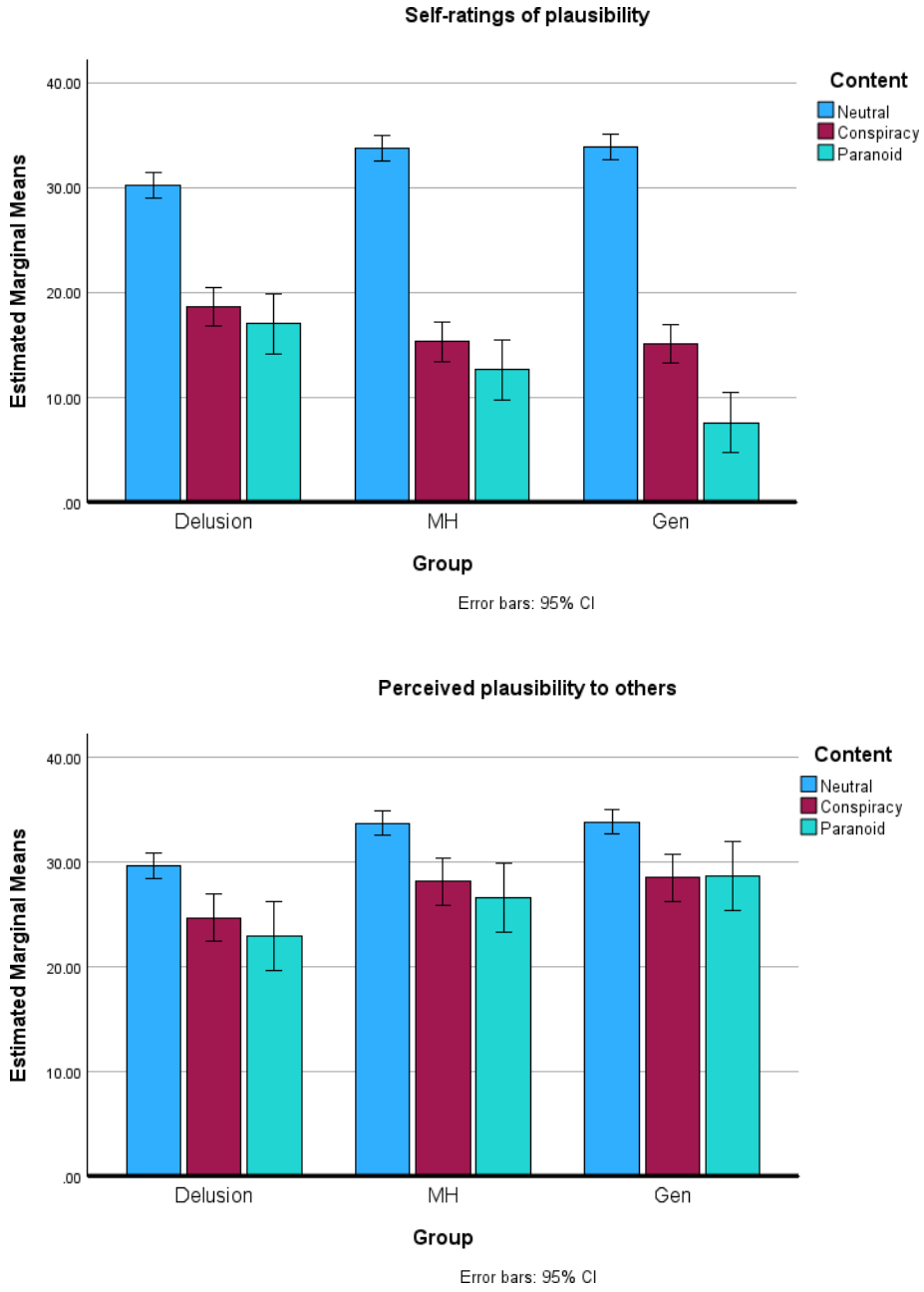
	Delusional beliefs M(SD)	Mental health M(SD)	General population M(SD)	Group differences
Network size	25.73 (19.06)	16.00 (10.71)	14.59 (11.45)	$F(2, 63) = 3.98$, $p < .05$.
Network diversity	6.91 (2.02)	6.23 (2.64)	5.09 (1.52)	$F(2, 63) = 4.18$, $p < .05$
Embedded network	2.59 (1.76)	2.23 (1.48)	2.18 (1.37)	$F(2, 63) = .46$, $p = .631$.

Belief Sharing

Belief sharing was determined by exploring participants' willingness to share their beliefs. However, before considering this, it was important to consider participants' belief plausibility (how plausible they think each type of belief is) and their perceived belief consensus (how much they think other people make similar estimates of plausibility). Plausibility ratings for self and attributed to others for the three types of beliefs are shown in Figure 2.

Figure 2

Plausibility Ratings for Self and Attributed to Others



Belief Plausibility. The MANOVA (Table 5) showed there was a statistically significant difference between the groups on the three dependent variables for belief plausibility.

Following univariate tests, Games-Howell post hoc tests revealed that neutral belief plausibility was higher in the DEL compared to both control groups ($p<.001$). However, there

was no significant difference between the GEN and MH groups (p=.986). Paranoid belief plausibility was higher in the DEL compared to the GEN group (p<.001) and higher in the MH group compared to the GEN group (p<.05). There was no difference between the DEL and the MH group (p=.087). For conspiracy beliefs, the DEL gave significantly higher plausibility scores compared to both the MH and the GEN groups (both p<.05). However, there was no significant difference between the GEN and MH groups (p=.989).

Overall, people with delusions thought that neutral and conspiracy beliefs were more plausible than both control groups and that paranoid beliefs were more plausible than the GEN group.

Table 5

Belief Plausibility Scores

	Delusional beliefs **M(SD)**	Mental health **M(SD)**	General population **M(SD)**	**Group differences**
Neutral belief plausibility	30.23 (4.36)	33.69 (1.52)	33.82 (3.29)	
Paranoid belief plausibility	17.00 (8.28)	12.59 (7.69)	7.55 (3.20)	$F(6, 122) = 6.44$, Wilks' $\Lambda = .58$; partial $\eta 2 = .241$. $p < .001$
Conspiracy belief plausibility	18.64 (5.65)	15.27 (3.76)	15.09 (3.22)	

Belief Consensus. Summary statistics for the three groups are shown in Table 6. There was no statistically significant difference between groups for neutral belief consensus scores, with all groups scoring close to zero, indicating a perceived consensus between themselves and others. However, for paranoid beliefs, consensus scores statistically differed between groups and the post hoc Tukey test revealed that the DEL had less negative consensus scores than the GEN group (p<.001) however there was no significant difference

between the DEL and MH group (p=.081), meaning that they thought other people would share their beliefs. However, no difference was found between the MH and GEN groups (p=.141). For conspiracy beliefs, consensus scores statistically differed between groups. Post hoc Tukey test revealed that the DEL had much fewer negative consensus scores than the MH group (p<.01) and GEN group (p<.01) which again suggested that they thought other people would share their beliefs.

Overall, all participants perceived a high level of consensus between themselves and others concerning neutral beliefs, which is perhaps unsurprising given how mundane the beliefs were. For both control groups, there was much less consensus about conspiracy and paranoid beliefs, which were perceived as much more plausible to others than to self. However, this effect was much more muted in the deluded patients, who perceived less difference between their perspective and that of others for these kinds of beliefs.

Table 6

Belief Consensus Scores

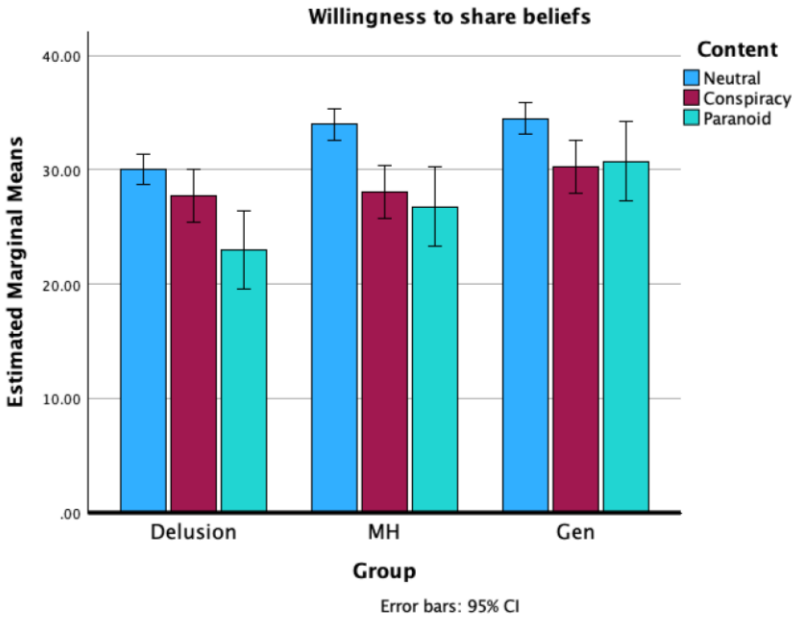
	Delusional beliefs **M(SD)**	Mental health **M(SD)**	General population **M(SD)**	**Group differences**
Neutral consensus	.64 (2.61)	.00 (1.80)	.05 (1.00)	F(2, 63) =.753, p = .475.
Paranoid consensus	-5.91 (14.23)	-14.00 (12.70)	-21.09 (9.29)	F(2, 63) =8.460, p <.001
Conspiracy consensus	-6.00 (7.28)	-12.82 (7.94)	-13.36 (6.76)	F(2, 63) =6.870, p <.01

Sharing Beliefs. Scores for willingness to share beliefs are shown in Figure 3, also in Table 7. The MANOVA showed there was a statistically significant difference between the

groups on the combined dependent variables for participants' willingness to share their beliefs with others.

Figure 3

Willingness to Share Beliefs



Games-Howell post hoc testing revealed that sharing neutral beliefs was lower in the DEL compared to the MH and GEN groups ($p<.001$). However, there was no significant difference between the MH and GEN groups ($p=.834$). Willingness to share paranoid beliefs was lower in the DEL compared to the GEN group ($p<.01$). However, although the scores for the MH group fell between the two other groups, there was no significant difference between the delusion and MH groups ($p=.276$) or between the MH and GEN groups ($p=.244$). There was no statistically significant difference in willingness to share conspiracy beliefs between the three groups. Overall, people with delusions were less willing to share neutral beliefs with other people compared to both control groups and were less likely to share paranoid beliefs than the GEN group.

Table 7

Belief Sharing Scores

	Delusional beliefs **M(SD)**	Mental health **M(SD)**	General population **M(SD)**	**Group differences**
Neutral share belief	30.05 (5.21)	33.95 (1.29)	34.50 (.91)	
Paranoid share belief	23.00 (8.55)	26.77 (8.64)	30.73 (6.97)	$F(6, 122) = 6.05$, $p < .001$; Wilks' $\Lambda = .58$; partial $\eta 2 = .23$.
Conspiracy share belief	27.73 (4.85)	28.09 (6.44)	30.23 (4.86)	

AB Game

Judgements of Similarity. The AB game assessed a person's ability to identify a similar person and cooperate with them to achieve a goal. If the person cooperated with the similar person, they were given a categorical score of yes. If they did not cooperate they were given a categorical score of no. As categorical data was used, five Chi-square tests were conducted to look at group differences in judgements of similarity for each belief type (neutral, political, conspiracy and paranoid). No differences were shown between the groups for any belief type (neutral, paranoid, political, or conspiracy beliefs; see Table 8).

Table 8

Alignment Scores

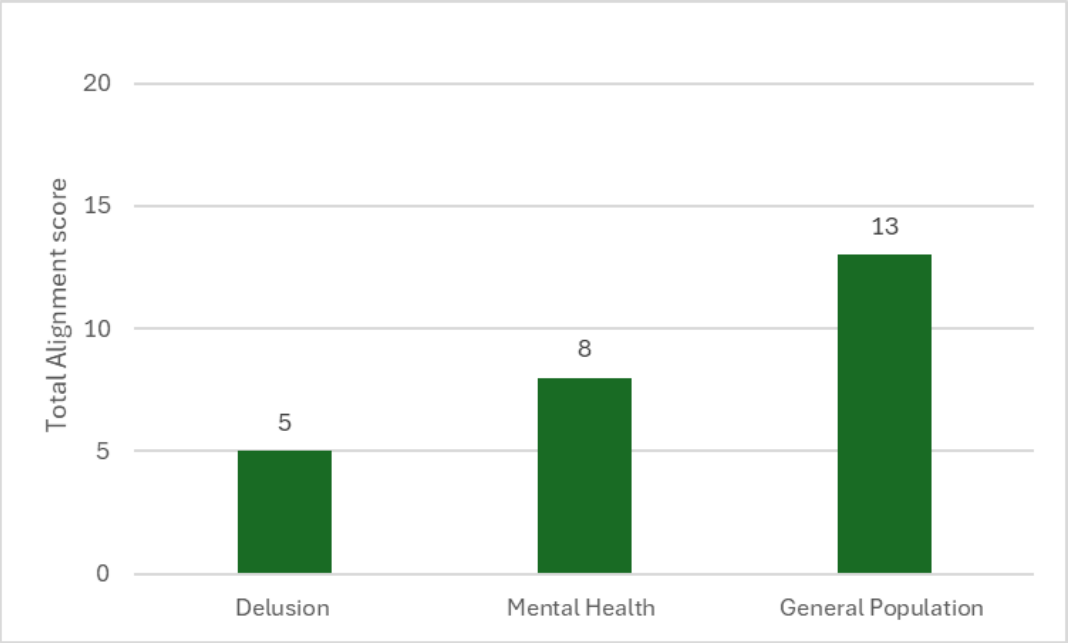
	DEL (frequency)	Mental health (frequency)	General population (frequency)	Group differences
Total Alignment				
Yes	5	8	13	X^2 (2, 66) = 6.219, p <.05
No	17	14	9	
Neutral alignment				
Yes	14/22	16/22	20/22	X^2 (2, 66) = 4.62, p = .099
No	8/22	6/22	2/22	
Political alignment				
Yes	15/22	17/22	17/22	X^2 (2, 66) = .63, p = .728
No	7/22	5/22	5/22	
Conspiracy alignment				
Yes	16/22	20/22	18/22	X^2 (2, 66) = 2.44 p = .295
No	6/22	2/22	4/22	
Paranoid alignment				
Yes	15/22	18/22	15/22	X^2 (2, 66) = 1.38, p = .503.
No	7/22	6/22	7/22	

Note: Yes = The number of participants who identified and cooperated with a similar person out of 22. No = the number of participants who did not identify and cooperate with a similar person out of 22.

The first row of Table 8 and Figure 4 shows the number of participants in each group who aligned their beliefs across all four types. Despite the non-significant results for individual items, this shows a tendency for people in the DEL to be less likely to co-ordinate their beliefs, with only five participants aligning with people on all four tasks.

Figure 4

Number of Participants Who Aligned with Others Across all Four Types of Beliefs



Additional Analyses

Threat and trust in sharing beliefs were explored. there was no significant difference between groups for participants' level of threat in sharing neutral beliefs (Table 9). However, there was a significant difference in perceived threat when sharing paranoid beliefs and conspiracy beliefs. For paranoid beliefs, Games-Howell post-hoc tests found that people in the DEL reported significantly higher levels of threat compared to the GEN group ($p<.002$) and that the MH group also reported higher levels of threat compared to the GEN group ($p<.032$). However, there was no difference between the delusion and MH groups ($p=.579$). For conspiracy beliefs, Games-Howell post-hoc tests found that the MH group perceived significantly higher levels of threat compared to the GEN group ($p<.035$). However, no differences were found between the DEL and the MH ($p=.739$) and GEN groups ($p=.145$).

In terms of trust, there was a significant difference between groups for people's trust when sharing neutral and paranoid beliefs with others but there was no significant difference

in the case of conspiracy beliefs. For neutral beliefs, Games-Howell post hoc tests found that people in the DEL expressed less trust compared to the GEN group (p<.001). However, there was no significant difference seem between the DEL and MH group, and MH group and GEN group. For paranoid beliefs, Games-Howell post-hoc tests found that people in the DEL reported significantly lower levels of trust compared to the GEN group (p<.001), and the MH group also had lower levels of trust compared to the GEN group (p<.007). However, there was no difference between the delusion and MH groups (p=.803).

Table 9

Threat and Trust Scores for Reality-Sharing

	Delusional beliefs **M(SD)**	Mental health **M(SD)**	General population **M(SD)**	**Group differences**
		Reality Sharing		
Neutral Threat	2.27(1.78)	1.82 (1.37)	1.45 (1.40)	Welch F(2, 6) =41.52, p = .253.
Paranoid Threat	3.36 (1.87)	2.86 (1.81)	1.64 (1.22)	Welch F(2, 63) =40.21, p = .001.
Conspiracy Threat	2.6 4(1.71)	3.05 (1.94)	1.77 (1.23)	Welch F (2, 40.37) =3.99, p = .026.
Neutral Trust	5.18 (1.53)	6.05 (1.13)	6.73 (.70)	Welch F(2, 38.13) =10.18, p <.001.
Paranoid Trust	4.45 (1.95)	4.82 (1.87)	6.32 (1.04)	Welch F(2, 38.31) =10.65, p <.001.
Conspiracy Trust	5.0 0(1.57)	5.05 (1.50)	5.73 (1.49)	F(2,63) =1.58, p = .213.

Assumptions

The MANOVAs for belief plausibility and belief sharing should be interpreted with caution as issues with assumptions meant the MANOVAs were conducted without transforming variables. Therefore there may be a loss of statistical power. (see Appendix S).

Discussion

The overall aim of this study was to use quantitative methods to explore two novel areas of reality sharing: belief sharing and judgements of similarity to self. Reality sharing

requires people within a group to share their beliefs and agree about the nature of reality. It is essential to coalitional formation, as it can lay the foundation for cooperating with group members to facilitate negotiations and problem-solving. Furthermore, the ability to identify a similar person is vital for cooperation on important tasks, where a goal cannot be achieved alone.

The first hypothesis aimed to understand participants' social networks and stated that people with delusions will have smaller social networks compared to the two control groups. Against expectation, this hypothesis was not met. People with delusions were found to have larger social network sizes and diversity within their social network. This was not in line with previous research that has found that people with delusions are more socially isolated (Butter et al., 2017; Ryan et al., 2022; Savage et al., 2018).

Hypotheses two to four explored reality sharing, as a result of completing the novel belief exploration task. It was firstly important to understand how participants judged the plausibility of neutral, paranoid and conspiracy beliefs. The second hypothesis therefore stated that people with delusions will make higher plausibility ratings, especially for paranoid beliefs. This hypothesis was met, as overall, people with delusions were significantly more likely to believe neutral, and conspiracy beliefs when compared to both control groups. They were also more likely to believe paranoid beliefs compared to the GEN group. No significant difference was found between people with delusions having high levels of belief plausibility when compared to the MH group.

The study then assessed perceived consensus (how likely participants were to think that other people shared their beliefs). Hypothesis three stated that people with delusions would estimate that others would give higher ratings of belief plausibility, especially for paranoid beliefs. In other words, they will not realise that other people judge these beliefs as

implausible. This hypothesis was met, as people with delusions were significantly more likely to think that other people shared conspiracy beliefs when compared to both control groups. Furthermore, people with delusions were significantly more likely to think that other people shared their paranoid beliefs when compared to the GEN group and although non-significant, were more likely to think that other people shared their paranoid beliefs when compared to the MH group.

Once belief plausibility and perceived consensus were determined, belief sharing was explored. Hypothesis four stated that people with delusions would be less willing to discuss their beliefs with others compared to the control groups. This hypothesis was partially met as people with delusions were less likely to share neutral beliefs with other people compared to both control groups and were less likely to share paranoid beliefs than the GEN group. However, no difference was found between the delusion and MH groups for sharing paranoid beliefs.

Overall, in line with Bentall, (2023; 2024) the results highlighted that people with delusions may have an impairment in reality sharing as they are more likely to believe a belief is plausible, think that other people would share that belief, and are less likely to share their beliefs with others. Therefore, people who experience delusional beliefs, may not feel a desire to share their beliefs and participate in effective negotiations with others. This could mean that they will generate their beliefs idiosyncratically and will not test their beliefs in social contexts. However, the results for belief plausibility and sharing beliefs should be taken with caution as data transformation issues, meant that the MANOVAs were conducted with an accepted loss of statistical power. Due to this the findings have low generalisability.

The final hypothesis explored cooperation through the AB game. It stated that people with delusional beliefs will not align and cooperate with a similar person compared to the

control groups. This hypothesis was partially met as although no significant differences were found between groups for specific neutral, paranoid, conspiracy, or political beliefs, a significant difference was found between groups for total cooperation (cooperation across all four beliefs combined) which showed that people in the DEL were unable to decide who was similar to them and coordinate with them. In line with the hypothesis of Bentall (2023; 2024), the result may be tentatively interpreted as evidence for difficulties in tracking the belief alignment of similar others in people with delusional beliefs. This impairment could impact people's ability to judge who is similar to them and coordinate with them to test out their realities. This inability to test out their beliefs in social contexts means that people will generate their beliefs idiosyncratically. However, it is worth noting that the tests conducted for cooperation were significantly underpowered in terms of sample size, which could have impacted the results.

The additional analyses found that when thinking about sharing paranoid beliefs with others, people in the DEL felt more threatened compared to the GEN group but not the MH group. When thinking about sharing neutral or paranoid beliefs with others, people in the DEL had less trust in others compared to both groups. This suggested that when thinking about reality sharing, threat and trust levels are impacted in people with delusions. This could relate to previous literature that found low trust and high threat in people with delusions (Dudley & Over, 2003; Freeman, 2016), or might be a result of a person's inability to perceive who is similar to them and therefore judge who will act in their coalitions best interest (Boyer et al., 2015; Greenburgh et al., 2022). Furthermore, it could be a product of a person's inability to update their coalitional safety index, by monitoring and integrating environmental safety cues (Boyer et al., 2015). However, these predictions need further exploration.

Strengths and Limitations

In terms of strengths, the study explored a novel area of coalitional cognition using a patient sample with two control groups. NHS ethical approval was achieved which supported collection to the patient and MH groups and was utilised alongside a range of recruitment methods. A priori power established the target sample size, and post hoc power determined whether the study had statistical power. The study used two measures of delusion, one of which was a clinical tool designed to confirm active delusional ideation. All novel measures were piloted and feedback was gathered from experts with experience and clinicians working in the field. Finally, to account for confounding variables, the researchers conducted between-group calculations to assess for differences in sample characteristics.

However, several limitations were apparent. As the design was cross-sectional, a cause-and-effect relationship could not be established between delusional beliefs and the capacity to build a shared reality. This will have to await future research with more sophisticated designs. Furthermore, pre-registration of this study or a published protocol would have enhanced openness, trust, and transparency (Field et al., 2020). The study was conducted online, which meant that people who were less experienced in using technology may not have participated and subsequently the study may have recruited a socially connected subgroup of people with delusions. In terms of the sample, not all participants had a confirmed diagnosis and although the aim was to be inclusive and delusions were confirmed using the PANSS, it could have impacted the findings. A sensitivity analysis could have addressed these differences.

Furthermore, there were limitations in the measures used. The study developed a novel measure, the BET which had not been validated before use, which could have impacted the study's validity, as the author could not be confident that it measured what the study set out to measure.

Although the CSNI is a well-used measure in research it may be outdated, as it does not account for people having parents who are the same gender and gives higher scores to people who are part of a religious group, which suggests that people who are not part of a religious group are less social. In addition, the measure was quantitative, which meant that no details about the quality of participants' relationships were collected. Future research could consider using different social network measures that are more relevant to today's society and collect both quantitative and qualitative data.

In regard to analysing the data, a large number of analyses were carried out on a small dataset. This meant that there was a risk of type-1 proliferation while, at the same time, only large differences were detectable. Therefore the results of this proof-of-concept study should be taken with caution and future research should aim to test out these concepts in larger samples.

Furthermore, differences in ethnicity could have impacted the outcome. Including an additional question such as *"How similar do I think this person is to myself?"*, would have enhanced the researcher's understanding of judgements of similarity further. Finally, the study assessed delusions broadly whereas, subtypes of delusions could show differences in reality sharing and cooperation.

Clinical Implications

This project aimed to explore, the newly developing area of coalitional cognition in people with delusional beliefs. This project therefore has the potential to open a novel avenue for understanding how delusional beliefs are formed and maintained. If the mechanisms tested are implicated in delusions, the findings could help support the design and delivery of novel psychological interventions. Furthermore, they have the potential to identify new ways in which clinical teams can identify at-risk populations.

Future Research

Future research could focus on using more sophisticated designs in larger and diverse populations, that would provide optimum power to understand reality sharing. This would provide more certainty in the findings and enable the use of advanced statistics to analyse the data (i.e., logistical regression for the AB game). The AB game would benefit from being adapted to contain a Likert scale rating of similarity rather than using a categorical variable of yes/no. Future studies could aim to understand reality sharing and cooperation in delusion subtypes (i.e., grandiose, paranoid etc.). Furthermore, future research could aim to understand other areas of coalitional cognition (Cikara 2021).

Conclusion

The current project explored two novel areas of reality sharing (an aspect of coalitional cognition) in people with delusional beliefs: belief sharing and judgements of similarity to self. The findings suggested that people with delusions had larger social networks. Furthermore, the study identified that people with delusions may have impairments in their ability to reality share. In particular, people with delusions may find it harder to share their beliefs and tentatively may have some difficulties with judging who is similar to them. Although, lack of power could have impacted the results. Future research should aim to repeat or build upon this study to research reality sharing and other aspects of coalitional cognition, using more sophisticated designs with larger samples. This will help determine whether the findings are accurate. Understanding more about the nature of coalitional cognition has the potential to open a novel avenue for understanding how delusional beliefs are formed and maintained.

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Appendix A

STROBE Guidelines

STROBE Statement—Checklist of items that should be included in reports of ***cross-sectional studies***

	Item No	Recommendation	Page No
Title and abstract	1	(*a*) Indicate the study's design with a commonly used term in the title or the abstract	66
		(*b*) Provide in the abstract an informative and balanced summary of what was done and what was found	67
Introduction			
Background/rationale	2	Explain the scientific background and rationale for the investigation being reported	69-74
Objectives	3	State-specific objectives, including any prespecified hypotheses	73-74
Methods			
Study design	4	Present key elements of study design early in the paper	74
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	74, 75, 77, 84
Participants	6	(*a*) Give the eligibility criteria and the sources and methods of selection of participants	76
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	76,78-83
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	74-75
Bias	9	Describe any efforts to address potential sources of bias	85
Study size	10	Explain how the study size was arrived at	78
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	86
Statistical methods	12	(*a*) Describe all statistical methods, including those used to control for confounding	86
		(*b*) Describe any methods used to examine subgroups and interactions	86
		(*c*) Explain how missing data were addressed	86
		(*d*) If applicable, describe analytical methods taking account of sampling strategy	86
		(*e*) Describe any sensitivity analyses	Not completed
Results			

Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	78
		(b) Give reasons for non-participation at each stage	78
		(c) Consider use of a flow diagram	78
Descriptive data	14*	(a) Give characteristics of study participants (e.g., demographic, clinical, social) and information on exposures and potential confounders	87-91
		(b) Indicate number of participants with missing data for each variable of interest	NA
Outcome data	15*	Report numbers of outcome events or summary measures	87-100
Main results	16	(*a*) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	87-100
		(*b*) Report category boundaries when continuous variables were categorized	87-100
		(*c*) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	NA
Other analyses	17	Report other analyses done—e.g., analyses of subgroups and interactions, and sensitivity analyses	99-100
Discussion			
Key results	18	Summarise key results with reference to study objectives	101-102
Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	104-105
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	102,106
Generalisability	21	Discuss the generalisability (external validity) of the study results	103
Other information			
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	NA

*Give information separately for exposed and unexposed groups.

Note: An Explanation and Elaboration article discusses each checklist item and gives methodological background and published examples of transparent reporting. The STROBE checklist is best used in conjunction with this article (freely available on the Web sites of PLoS Medicine at http://www.plosmedicine.org/, Annals of Internal Medicine at http://www.annals.org/, and Epidemiology at http://www.epidem.com/). Information on the STROBE Initiative is available at www.strobe-statement.org.

Appendix B

Shared and unshared aspects of the project

Researchers Jessica Twigg (JT) and Daisy Fitzpatrick (DF) completed a collaborative project as they both had an interest in delusional beliefs and their underlying mechanisms. As doctoral thesis projects are time-pressured, which can impact data collection it made sense to conduct a joint project to gather a larger sample of participants. Below shows how the projects were similar and any differences:

Similarities

- The study design
- The sample and participant recruitment
- Dad for both projects were collected jointly within a single test battery but each project analysed different measures (excluding screening and demographic information)
- NHS ethics application was shared between researchers.

Differences

- Topic area: DF assessed certainty and JT assessed coalitional cognition
- Aims and hypotheses
- Data analyses
- Project write up

JT's Aims and Hypotheses

Overall Aim: This project aimed to explore a newly developing area of coalitional cognition in people with delusions. It explored one aspect of coalitional cognition, reality sharing. Two distinct areas of reality sharing were explored: (1) judgements of similarity and (2) belief sharing.

Hypotheses: People with delusions will have smaller social networks than the two control groups (H1). People with delusions will make higher plausibility ratings, especially for paranoid beliefs (H2). People with delusions will estimate that others would give higher ratings of plausibility, especially for paranoid beliefs and will not realise that other people judge these beliefs as implausible (H3). People with delusions will be less willing to discuss their beliefs with others (H4). People with delusional beliefs will not be able to judge which people are similar to them, which will impact cooperation (H5).

Aims and hypotheses for the project by DF:

Examine processes related to judgements of certainty in patients experiencing delusional beliefs compared to controls, looking specifically at certainty judgments compared with accuracy and associated Response Times (RTs). Also to explore whether these relationships differ for threat-related and neutral materials. Hypothesised processes related to judgments of certainty will be different for individuals experiencing delusions with higher certainty ratings, and weaker relationships between certainty judgments and accuracy, and between judgments of certainty and RTs. The presence of threat content will impact these relationships leading to weaker correlations across all relationships.

Appendix C

Ethics Application Approval Letter

Ymchwil Iechyd a Gofal Cymru
Health and Care Research Wales

NHS
Health Research Authority

Miss Fitzpatrick and Miss Twigg
Trainee Clinical Psychologist
Sheffield Health and Social Care NHS Foundation Trust
Clinical Psychology Department
Cathedral Court
Vicar Lane
S12LTN/A

Email: approvals@hra.nhs.uk
HCRW.approvals@wales.nhs.uk

10 November 2023

Dear Miss Fitzpatrick and Miss Twigg

HRA and Health and Care Research Wales (HCRW) Approval Letter

Study title:	**Belief formation in deluded and non-deluded people**
IRAS project ID:	**325034**
REC reference:	**23/WA/0271**
Sponsor	**University Of Sheffield**

I am pleased to confirm that HRA and Health and Care Research Wales (HCRW) Approval has been given for the above referenced study, on the basis described in the application form, protocol, supporting documentation and any clarifications received. You should not expect to receive anything further relating to this application.

Please now work with participating NHS organisations to confirm capacity and capability, in line with the instructions provided in the "Information to support study set up" section towards the end of this letter.

How should I work with participating NHS/HSC organisations in Northern Ireland and Scotland?
HRA and HCRW Approval does not apply to NHS/HSC organisations within Northern Ireland and Scotland.

If you indicated in your IRAS form that you do have participating organisations in either of these devolved administrations, the final document set and the study wide governance report (including this letter) have been sent to the coordinating centre of each participating nation. The relevant national coordinating function/s will contact you as appropriate.

Please see IRAS Help for information on working with NHS/HSC organisations in Northern Ireland and Scotland.

How should I work with participating non-NHS organisations?
HRA and HCRW Approval does not apply to non-NHS organisations. You should work with your non-NHS organisations to obtain local agreement in accordance with their procedures.

What are my notification responsibilities during the study?

The standard conditions document "*After Ethical Review – guidance for sponsors and investigators*", issued with your REC favourable opinion, gives detailed guidance on reporting expectations for studies, including:

- Registration of research
- Notifying amendments
- Notifying the end of the study

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

Who should I contact for further information?
Please do not hesitate to contact me for assistance with this application. My contact details are below.

Your IRAS project ID is **325034**. Please quote this on all correspondence.

Yours sincerely,
Anne Gell

Approvals Specialist

Email: HCRW.approvals@wales.nhs.uk

Copy to: *Professor Richard Bentall*

List of Documents

The final document set assessed and approved by HRA and HCRW Approval is listed below.

Document	*Version*	*Date*
Copies of materials calling attention of potential participants to the research [Recruitment Poster - Delusional Belief Group]	2	19 October 2023
Copies of materials calling attention of potential participants to the research [Recruitment Poster - Mental Health Control]	2	19 October 2023
Copies of materials calling attention of potential participants to the research [Recruitment Poster - Healthy Control]	2	19 October 2023
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Sponsor Insurance]		31 July 2023
IRAS Application Form [IRAS_Form_07092023]		07 September 2023
Letter from sponsor [Sponsor Letter]		31 July 2023
Non-validated questionnaire [BET]	1	31 July 2023
Non-validated questionnaire [Demographics Q]	1	31 July 2023
Non-validated questionnaire [MDBS]	1	31 July 2023
Non-validated questionnaire [Confidence Judgement Q]	1	31 July 2023
Non-validated questionnaire [AB Game]	1	31 July 2023
Non-validated questionnaire [Debrief]	1	31 July 2023
Non-validated questionnaire [Millionaires]	1	31 July 2023
Organisation Information Document [OID]	1	19 October 2023
Other [Additional CI CV]	1	31 July 2023
Other [Additional Sponsor Letter]	1	31 July 2023
Other [Liability Certificate]	1	31 July 2023
Other [Ethical Review Response]	1	19 October 2023
Other [Ethical Review Response]	2	09 November 2023
Participant consent form [Phase two PIS and consen]	3	09 November 2023
Participant information sheet (PIS) [Phase one PIS and consent]	3	09 November 2023
Research protocol or project proposal [Study Protocol]	2	19 October 2023
Schedule of Events or SoECAT [SoECAT]	1	19 October 2023
Summary CV for Chief Investigator (CI) [CI CV]		31 July 2023
Summary CV for supervisor (student research) [Supervisor CV]		31 July 2023
Validated questionnaire [PDI]		
Validated questionnaire [GAD-7]		
Validated questionnaire [PHQ-9]		
Validated questionnaire [CSNI]		
Validated questionnaire [PANSS]		

IRAS project ID	325034

Information to support study set up

The below provides all parties with information to support the arranging and confirming of capacity and capability with participating NHS organisations in England and Wales. This is intended to be an accurate reflection of the study at the time of issue of this letter.

Types of participating NHS organisation	Expectations related to confirmation of capacity and capability	Agreement to be used	Funding arrangements	Oversight expectations	HR Good Practice Resource Pack expectations
Research activities and procedures as per the protocol and other study documents will take place at participating NHS organisations.	NHS Organisations will not be required to formally confirm capacity and capability, and research procedures may begin 35 days after provision of the local information pack, provided the following conditions are met. HRA and HCRW Approval has been issued The NHS organisation has not provided a reason as to why they cannot participateThe sponsor may start the research prior to the above deadline if the participating NHS organisation positively confirms that the research may proceed. The sponsor should now provide the local information pack to participating NHS organisations in England and/or Wales. A current list of R&D contacts is accessible at the NHS RD Forum website and these contacts MUST be used for this purpose.	An Organisation Information Document has been submitted and the sponsor is not requesting and does not expect any other agreement to be used with participating NHS organisations of this type.	A completed Schedule of Events has been provided	A Local Collaborator should be appointed at participating NHS organisations.	Where an external individual will be conducting any of the research activities that will be undertaken at this site type then they would be expected to hold a Letter of Access. This should be issued be on the basis of a Research Passport (if university employed) or an NHS to NHS confirmation of pre-engagement checks letter (if NHS employed). These should confirm Occupational Health Clearance. These should confirm standard DBS checks and appropriate barred list checks.

Other information to aid study set-up and delivery

This details any other information that may be helpful to sponsors and participating NHS organisations in England and Wales in study set-up.
The applicant has indicated that they do not intend to apply for inclusion on the NIHR CRN Portfolio.

Appendix D

Power Analyses

A Priori Power

For power related to social networks, a previous paper on schizophrenia and social networks (Horan et al., 2006) found that higher scores on the Brief Psychiatric Rating Scale (BPRS) correlated with lower social network sizes and showed an effect size of r = -.36. If we take this as an effect size, then a total sample size of 84 (28 per group) gives a power of 0.8 at an alpha of .05.

In terms of the novel belief exploration task, reality sharing related to coalitional cognition should be similar to studies of trust in paranoia. A recent study for a questionnaire measure of interpersonal trust and paranoia (Martinez et al., 2022) found an effect size of r = -.35. Given this is a population sample, we would expect deluded patients to show at least this difference compared to control groups. If we take this as an effect size, then a total sample size of 84 (28 per group) which gives a power of 0.8 at an alpha of .05.

Sample size estimates must be much more speculative for the coalition forming (AB) game as, to our knowledge, nothing like this has been attempted with psychiatric patients before. However, if we assume that non-deluded people make a coalition-based response of 80% of occasions (mean score = 8), and deluded patients make this response on 50% of occasions (chance level, mean score = 5) with an SD of 3 for each group (allowing 16% of controls to score at or below chance level and the same % of deluded patients to score normally), then the same sample size of 28 per group would give a power of 0.7 to detect group differences at alpha = .05. We recognise that this is on the edge of what is acceptable but believe that it is sufficient to justify going ahead given the innovative and exploratory nature of the measure.

Given the newness of the tests, the research team will aim to collect as many participants as possible.

Post Hoc Power

Table 9

Summary of Post Hoc Power Calculations

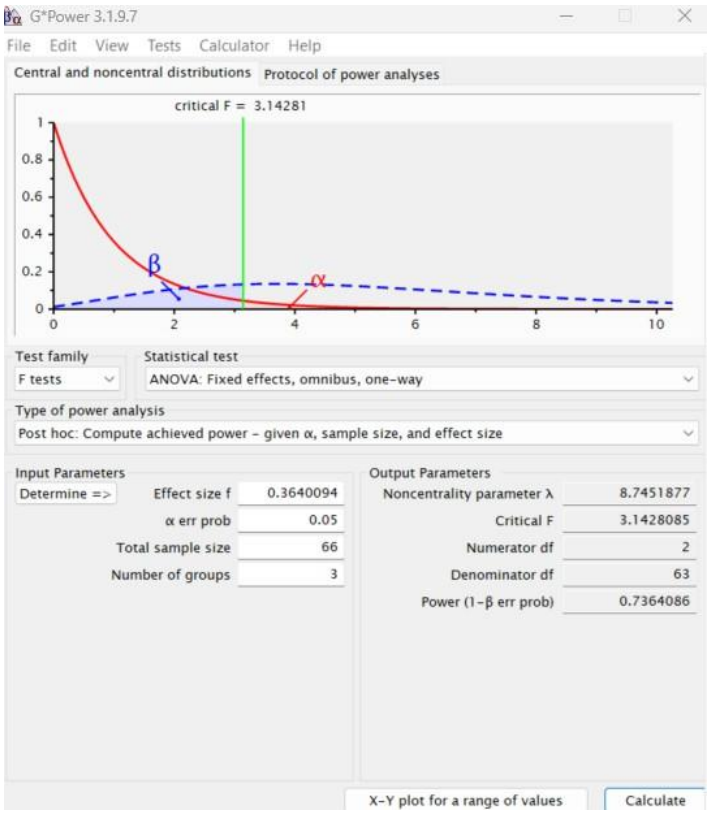
Statistical Test	Varible	Power
Social Network		
One-way ANOVA	Size	0.736
One-way ANOVA	Diversity	0.714
One-way ANOVA	Embedded network	0.123
Belief Exploration Task (Reality Sharing)		
One-way MANOVA	Plausibility	0.999*
One-way MANOVA	Sharing	0.999*
One-way ANOVA	Neutral Consensus	0.177
One-way ANOVA	Paranoid Consensus	0.967*
One-way ANOVA	Conspiracy Consensus	0.923*
AB Game (Cooperation)		
Chi-Square	Neutral	0.472
Chi-Square	Political	0.143
Chi-Square	Conspiracy	0.267
Chi-Square	Paranoid	0.166

Additional Analysis: Threat and Trust		
One-way ANOVA	Neutral Threat	0.351
One-way ANOVA	Paranoid Threat	0.899*
One-way ANOVA	Conspiracy Threat	0.644
One-way ANOVA	Neutral Trust	0.982*
One-way ANOVA	Paranoid Trust	0.949*
One-way ANOVA	Conspiracy Trust	0.285

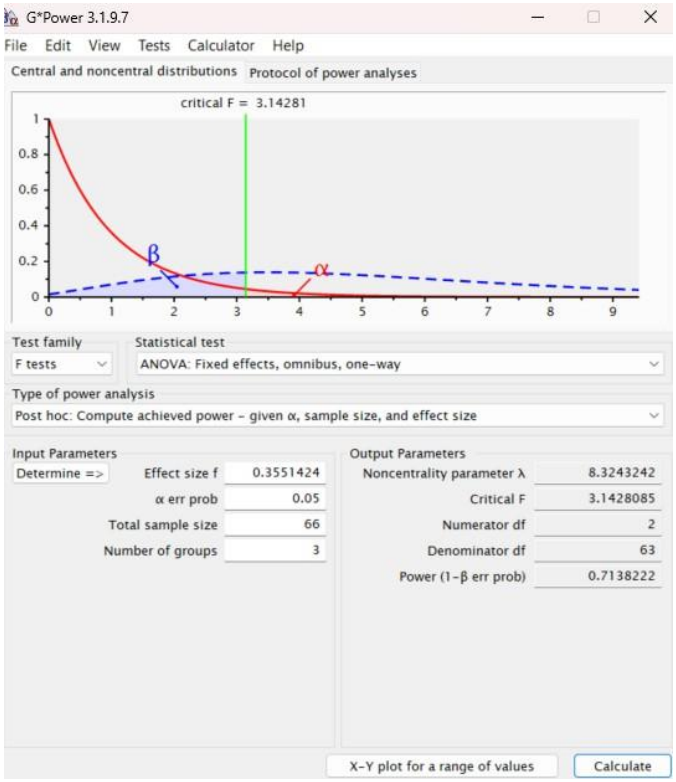
Note: * power is above 0.8

G*Power Output

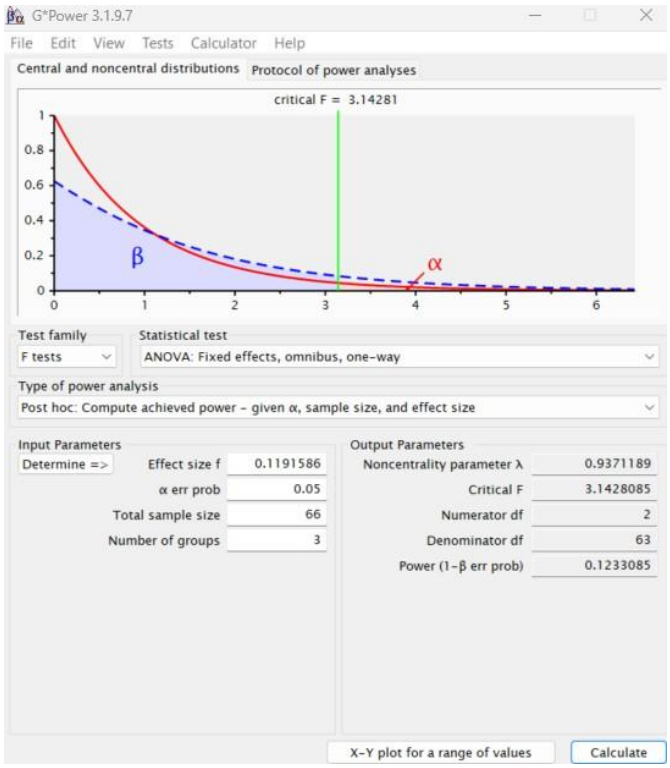
Social Network: ANOVA Network Size



ANOVA: Network Diversity

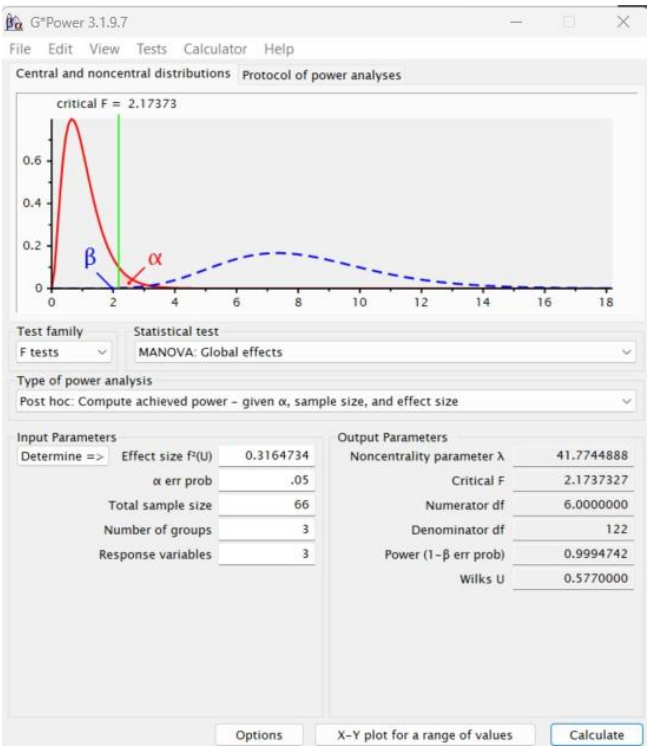


ANOVA Embedded Network

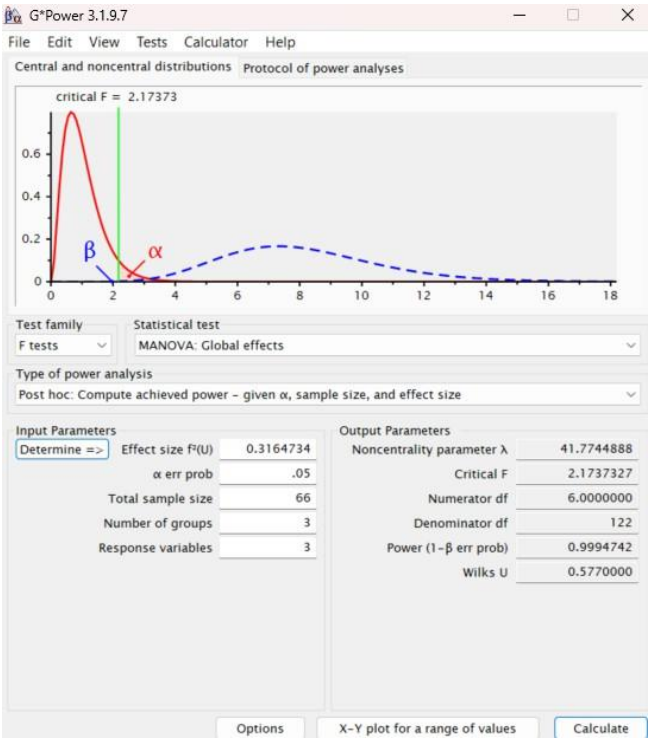


Belief Exploration Task

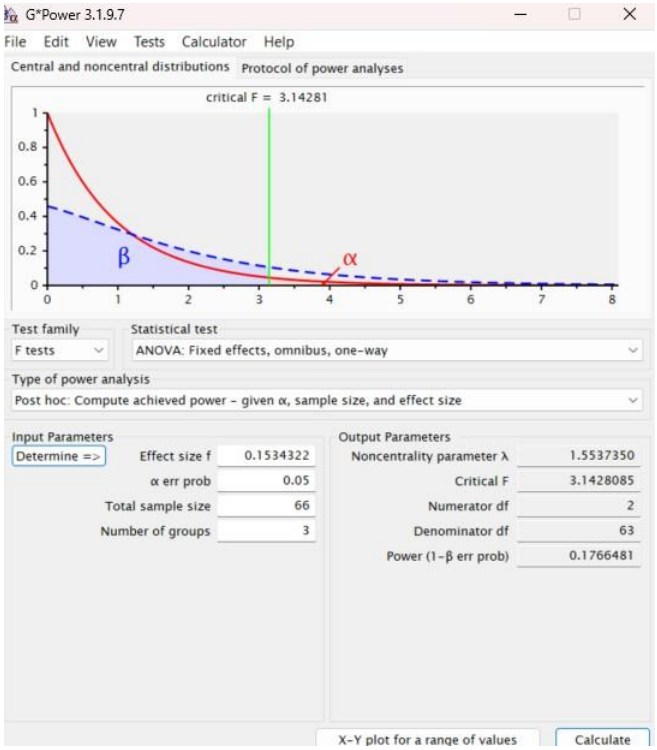
MANOVA: Belief Plausibility



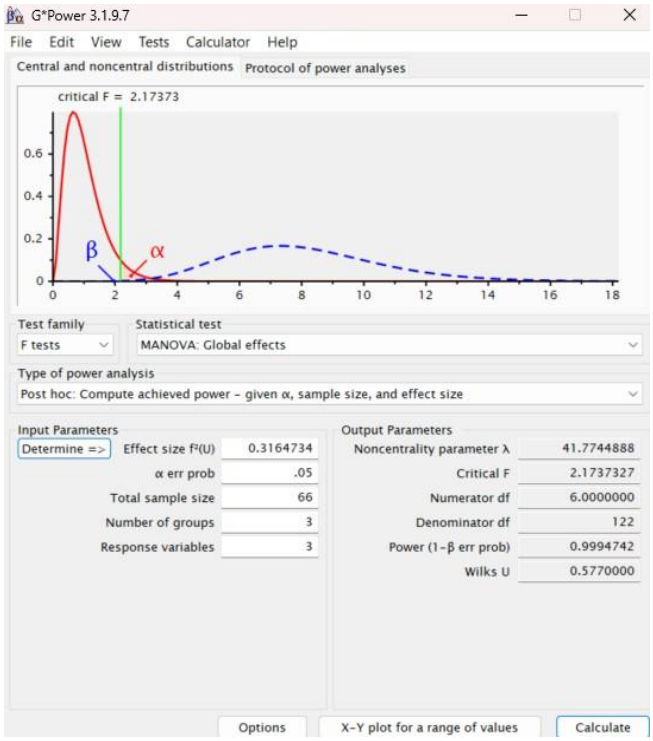
MANOVA: Sharing Beliefs



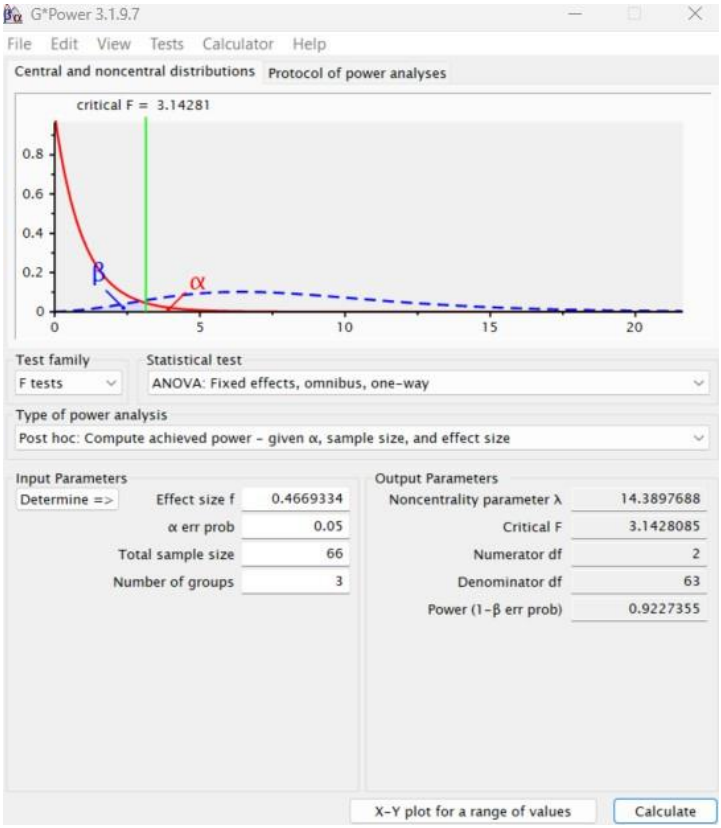
ANOVA: Neutral Consensus



ANOVA: Paranoid Consensus

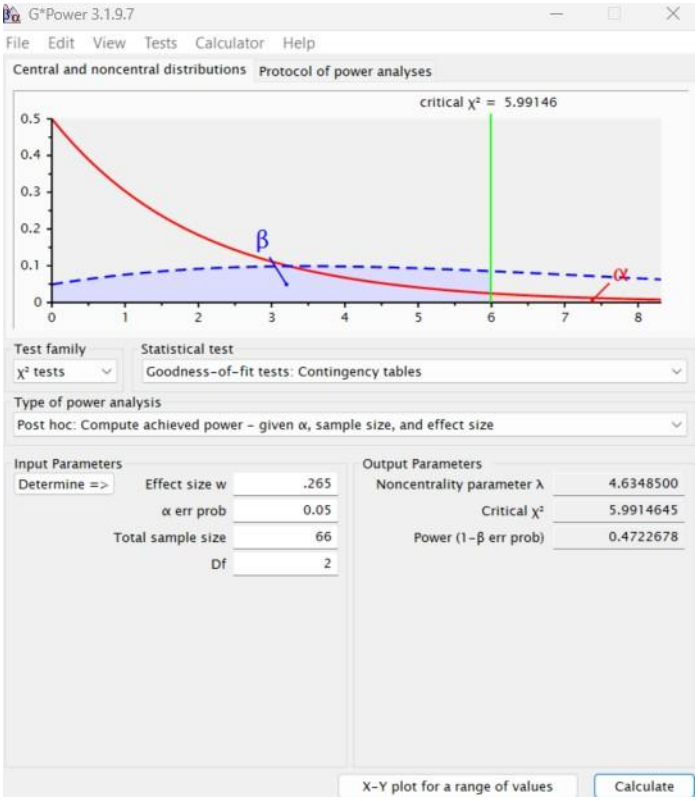


ANOVA: Conspiracy Consensus

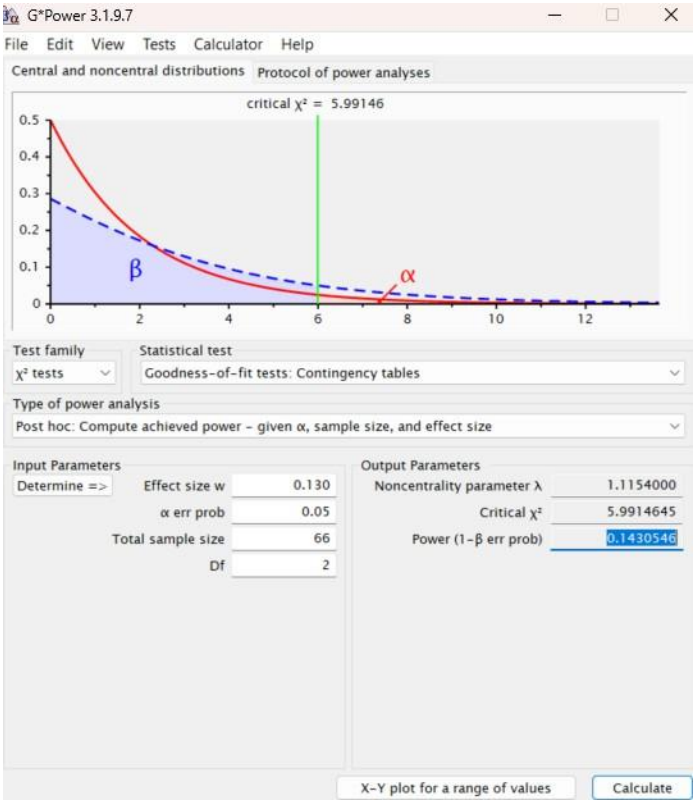


Cooperation

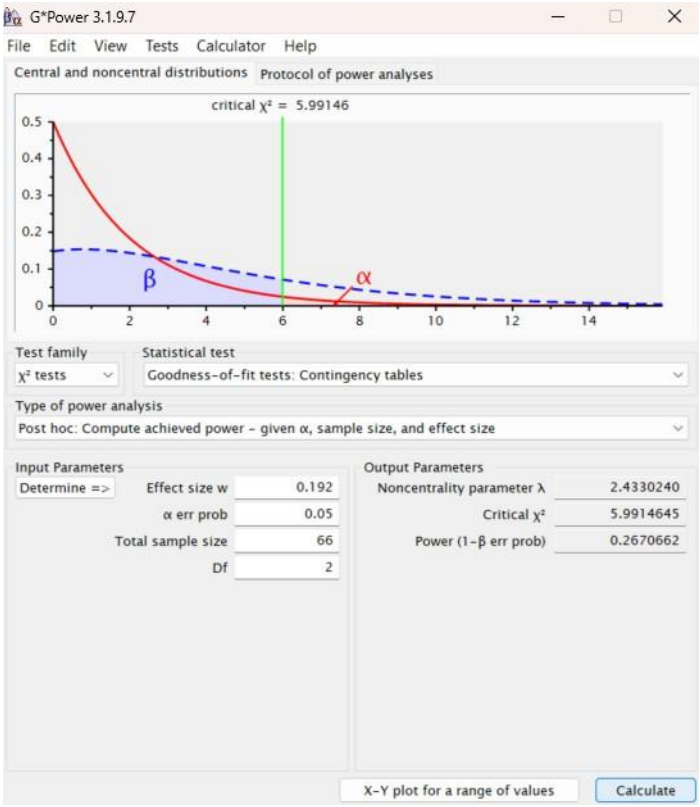
Chi-Square Neutral



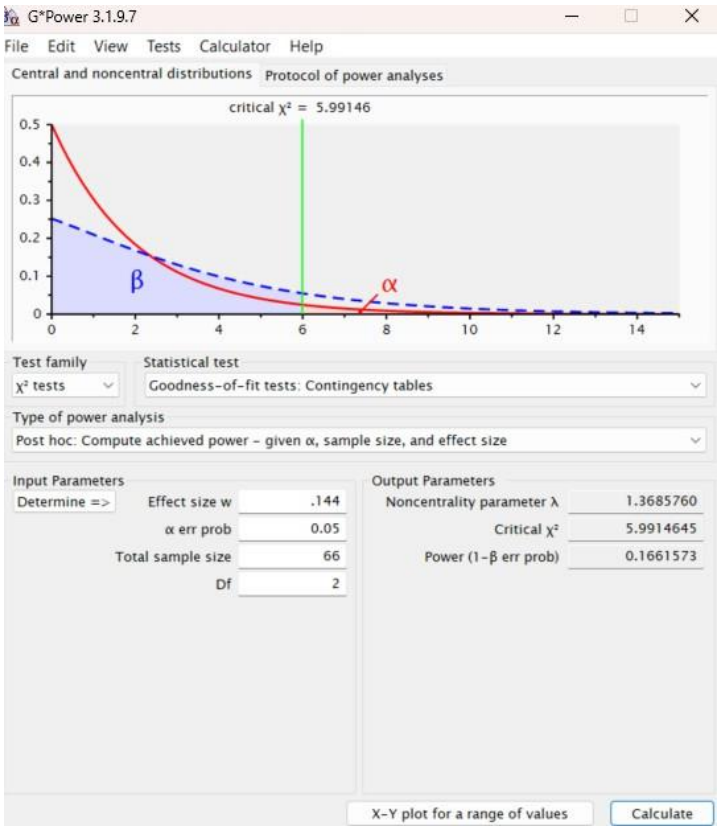
Chi-Square Political



Chi-Square Conspiracy

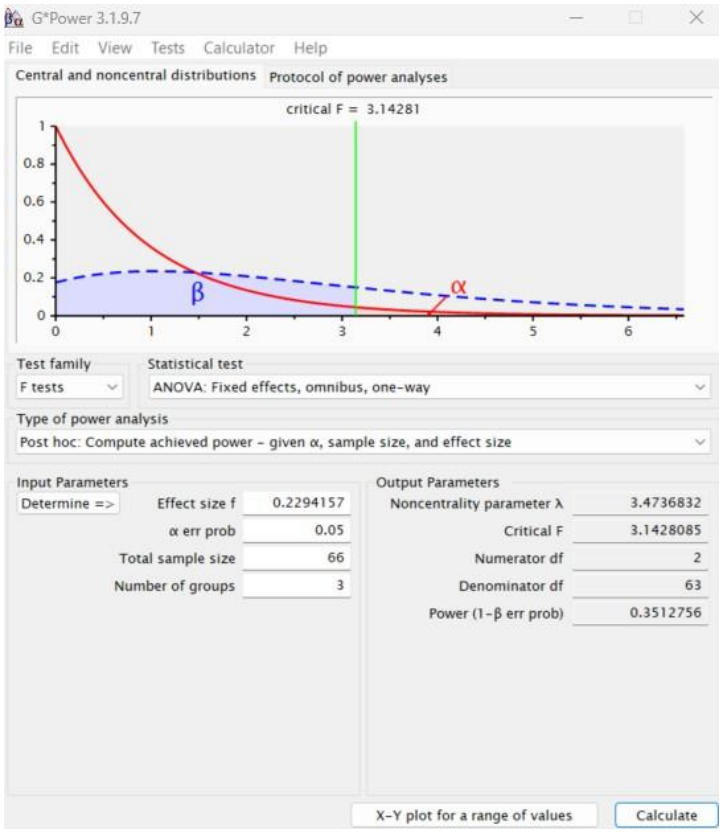


Chi-Square Paranoid

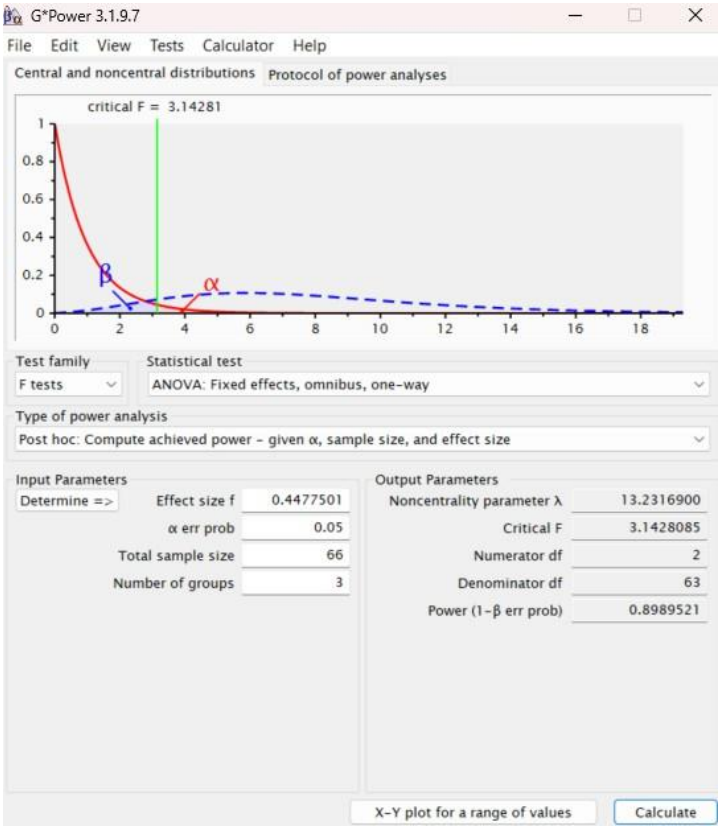


Threat and Trust

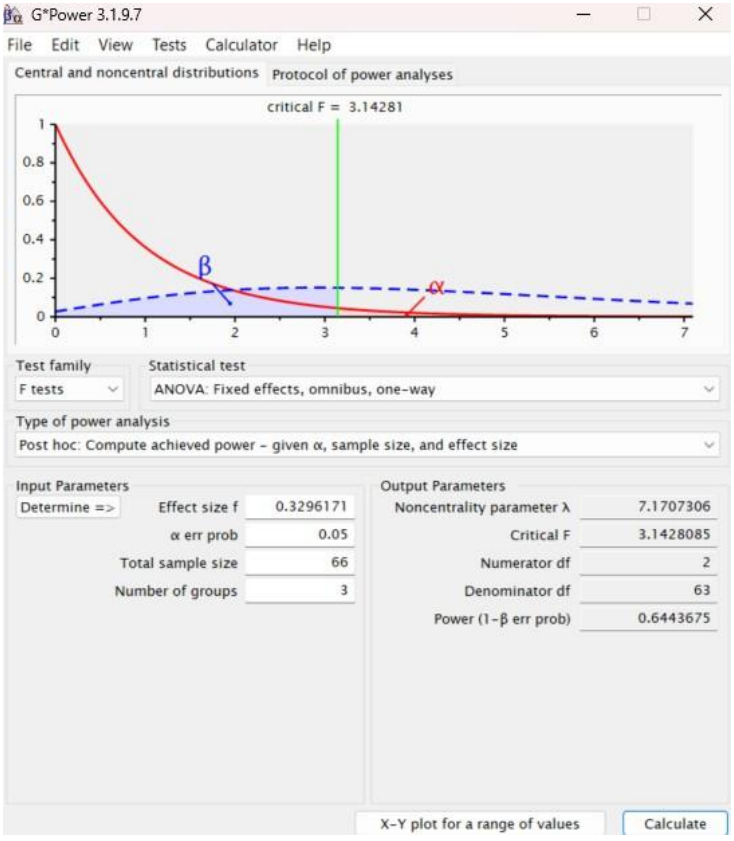
ANOVA Neutral Threat



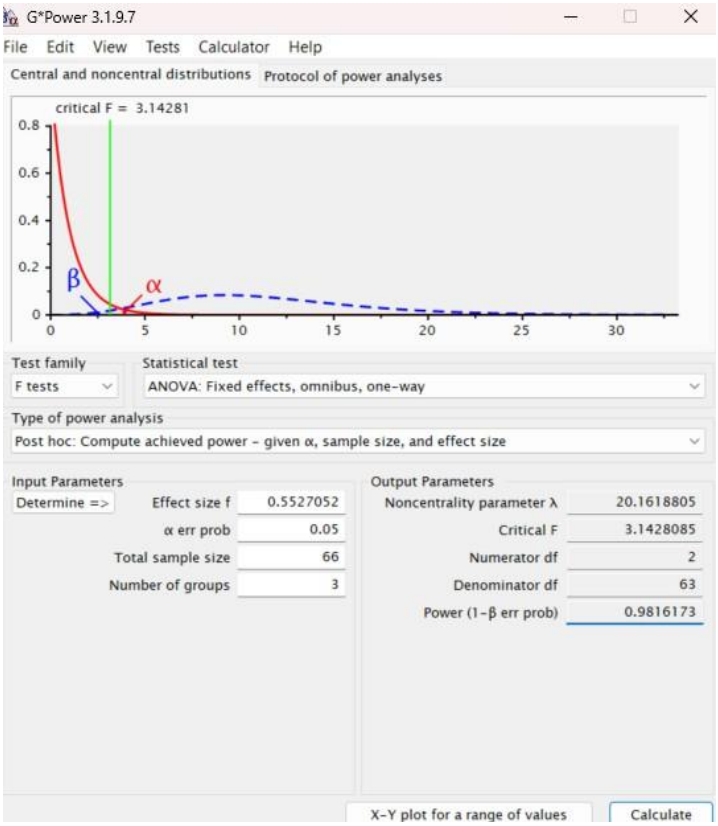
ANOVA Paranoid Threat



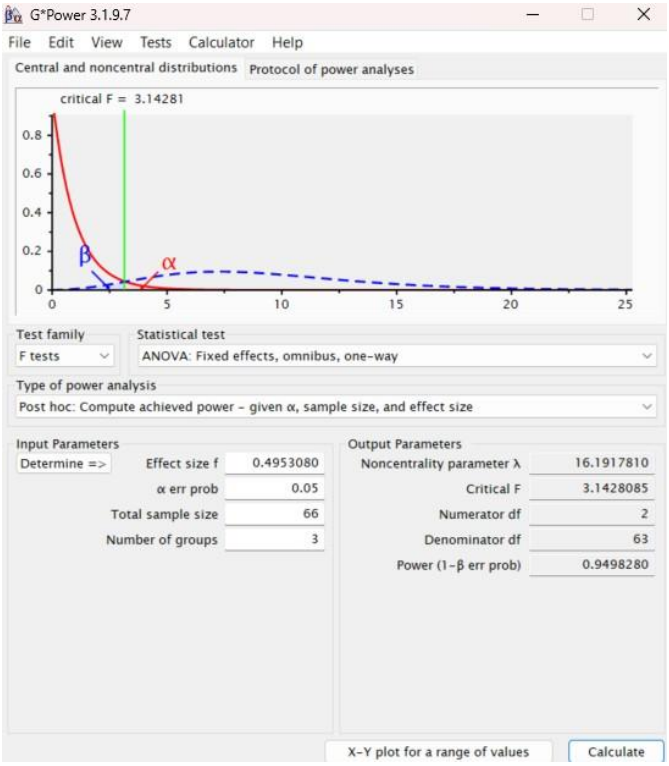
ANOVA Conspiracy Threat



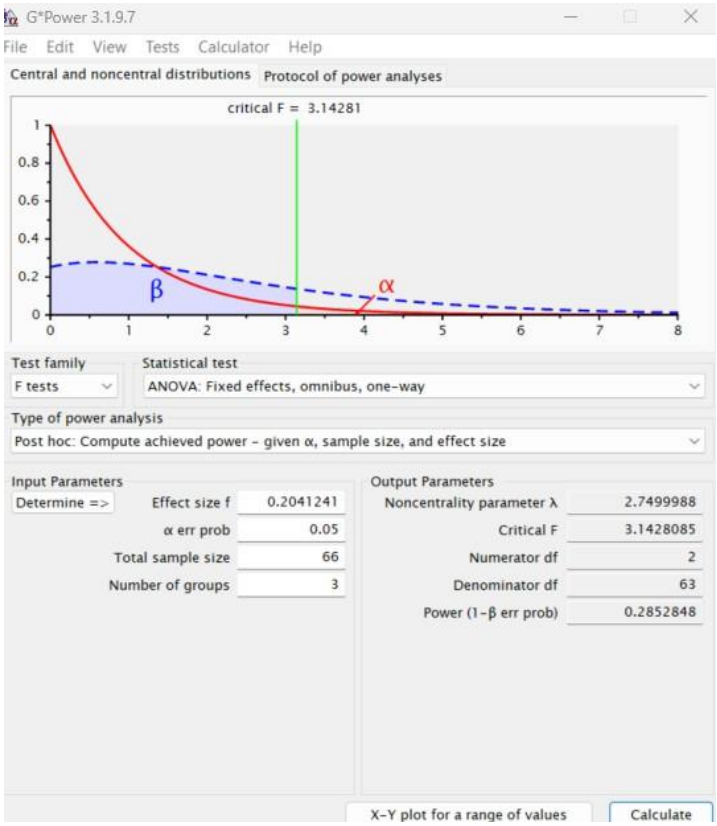
ANOVA Neutral Threat



ANOVA Paranoid Threat



ANOVA Conspiracy Threat


G*Power 3.1.9.7
File Edit View Tests Calculator Help
Central and noncentral distributions
Protocol of power analyses
critical F = 3.14281
β
α
Test family
F tests
Statistical test
ANOVA: Fixed effects, omnibus, one-way
Type of power analysis
Post hoc: Compute achieved power – given α, sample size, and effect size
Input Parameters
Determine =>
Effect size f 0.2041241
α err prob 0.05
Total sample size 66
Number of groups 3
Output Parameters
Noncentrality parameter λ 2.7499988
Critical F 3.1428085
Numerator df 2
Denominator df 63
Power (1-β err prob) 0.2852848
X-Y plot for a range of values
Calculate

Appendix E

Recruitment email

Hello,

Our names are Jessica and Daisy and we are both trainee clinical psychologists at the University of Sheffield.

We were wondering if you could help us with recruitment for our study.

Our study aims to understand more about the beliefs of people who have unshared beliefs or experiences that can be associated with psychosis.

We feel extremely passionate about this research as we both have people close to our hearts who have had difficult times with their mental health including experiences related to psychosis. Our hope is the findings would help influence the support people receive from mental health services in the future.

We would be extremely grateful for any support you can offer in terms of recruitment to phase one of our study and hopefully for those eligible phase 2 also (people can indicate their consent to this when completing phase 1).

Both phases are being held online and we are advertising this study through a flyer (see attached) which contains a web link and QR code that people can access in their own time.

We are offering people an incentive to complete the study. Those who complete phase one will have the chance to win one of a few £20 amazon vouchers. Those who would like to participate in phase two will receive a £10 amazon voucher on completion.

The study is being supported by the University of Sheffield and has received full NHS Ethical Approval. We have also received permission from the SHSC research development unit to advertise via SHSC services.

We are happy to send you further information or meet with you to explain our study further if you would like :).

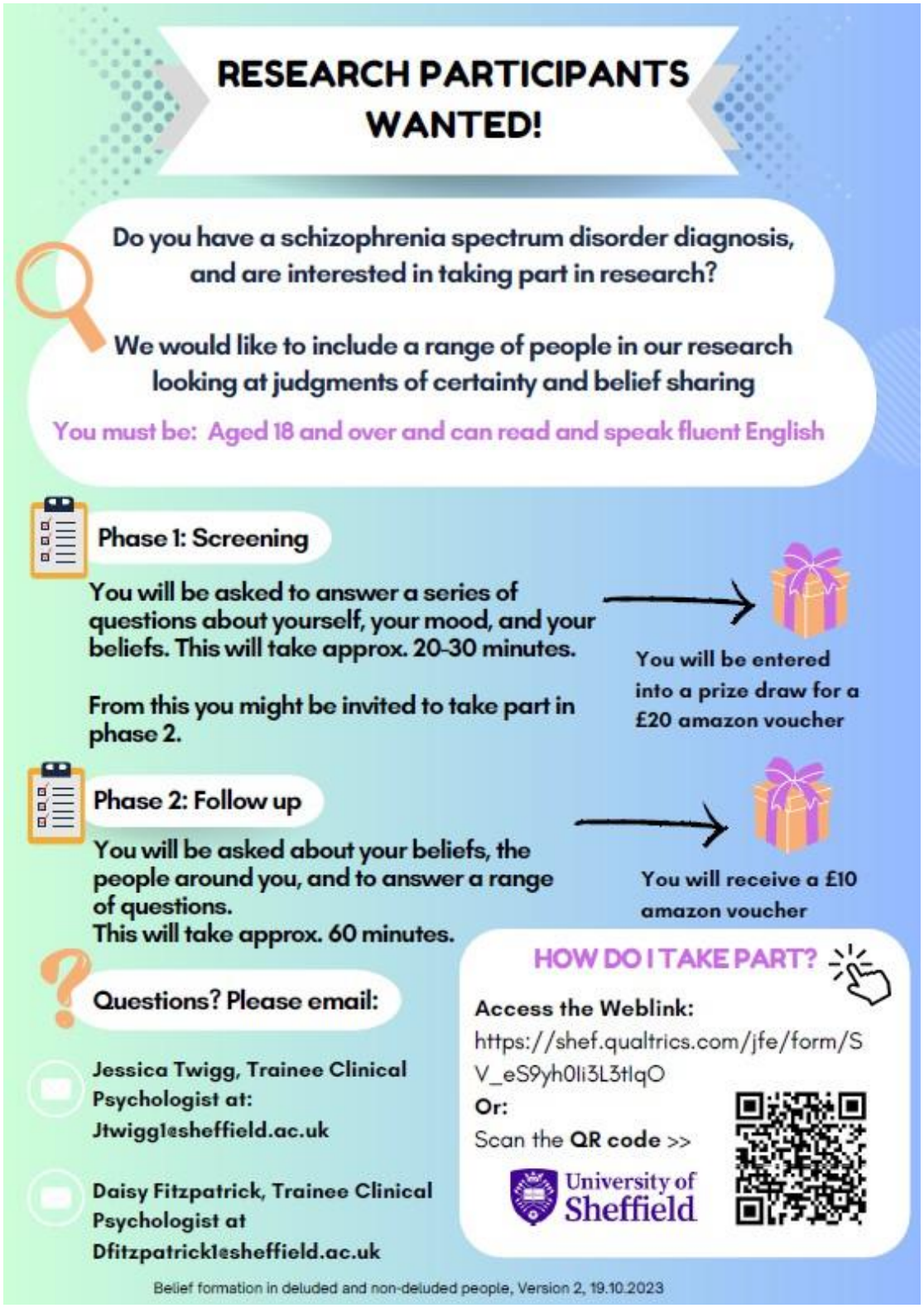
Thank you so much for your help,

Jess and Daisy

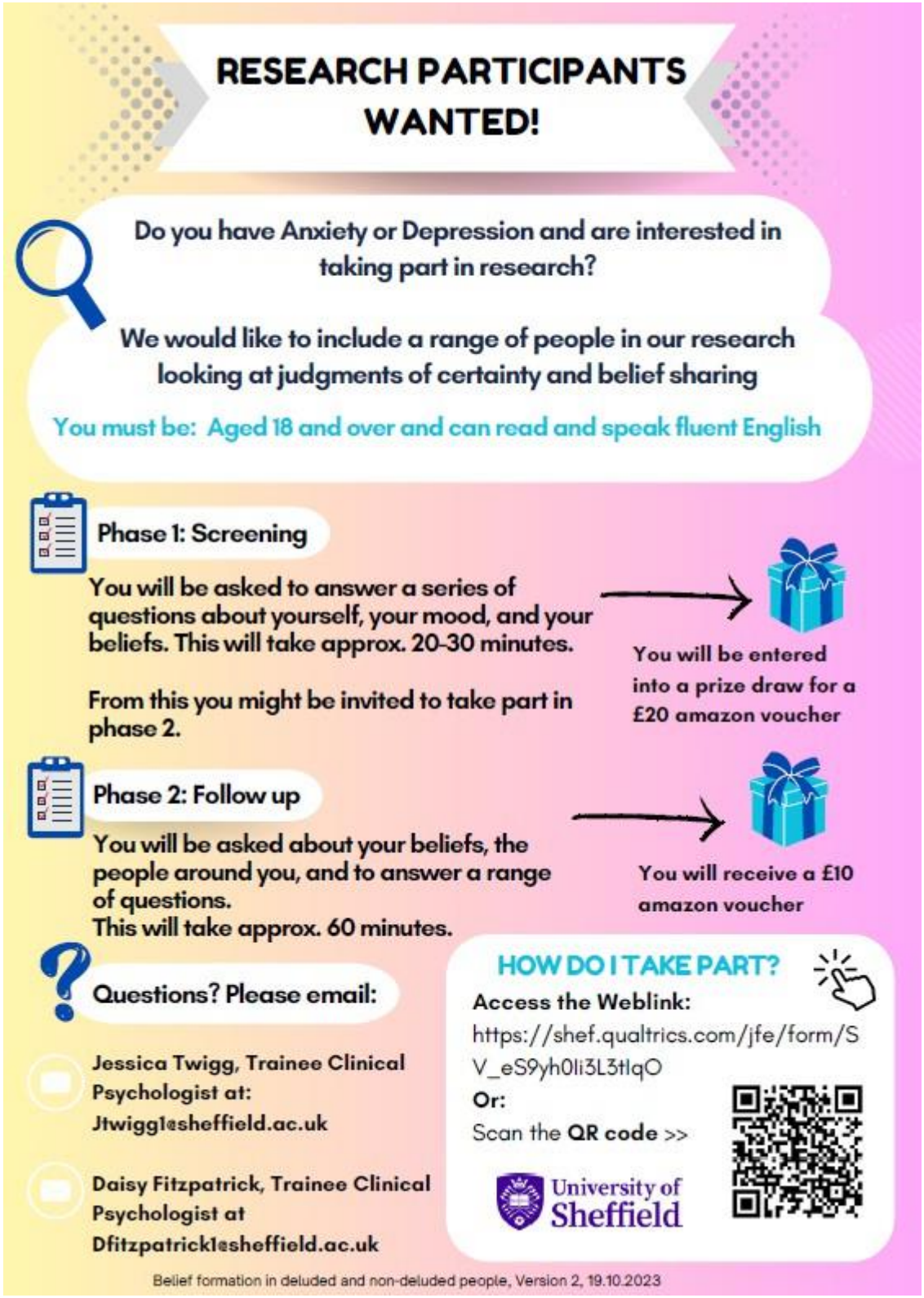
Appendix F

Recruitment Leaflets

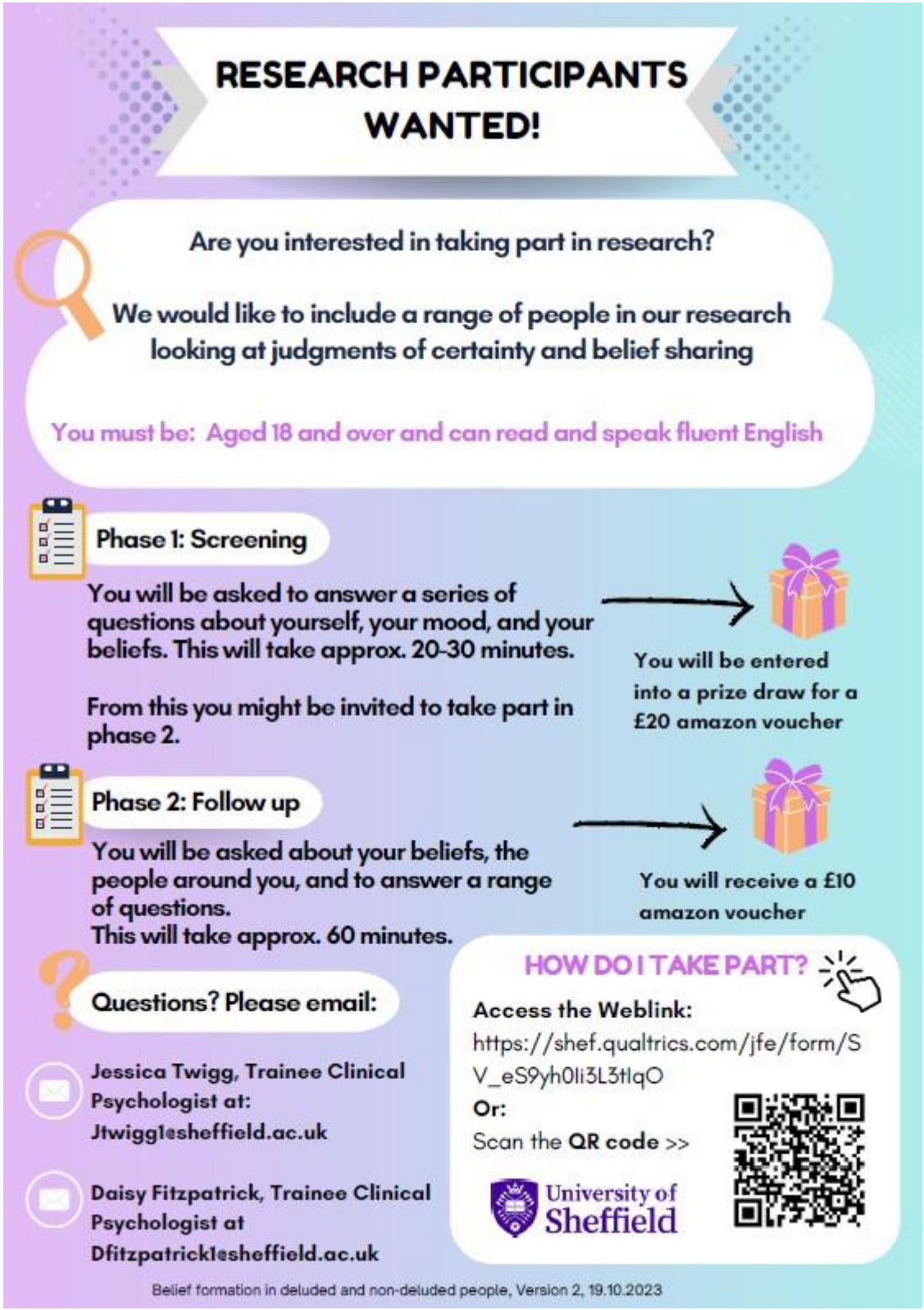
DEL



Mental Health Group



General Population Group



Appendix G

Demographic Questionnaire

University of Sheffield

Demographic Questionnaire

We would like to ask you a few questions about yourself

Do you have any current or past mental health diagnoses?

Yes ○ No ○

What mental health diagnoses do you have?

[ ]

Have you ever had or are you currently receiving psychiatric treatment? (This might include psychological therapies or pharmacological interventions).

Yes ○ No ○

What treatment have you recieved?

Do you currently take any psychiatric medication?

Yes No

Please list here:

How old are you (in years)?

How do you identify in terms of your gender?

- ◯ Male
- ◯ Female
- ◯ Non-binary / third gender
- ◯ Prefer not to say
- ◯ Other not listed above

Appendix H

PHQ-9

PATIENT HEALTH QUESTIONNAIRE-9 (PHQ-9)

Over the last 2 weeks, how often have you been bothered by any of the following problems? *(Use "✔" to indicate your answer)*	**Not at all**	**Several days**	**More than half the days**	**Nearly every day**
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way	0	1	2	3

FOR OFFICE CODING 0 + _____ + _____ + _____

=Total Score: _____

If you checked off any problems, how difficult have these problems made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	**Somewhat difficult**	**Very difficult**	**Extremely difficult**
☐	☐	☐	☐

Appendix I

GAD-7

GAD-7 Anxiety

Over the last two weeks, how often have you been bothered by the following problems?	Not at all	Several days	More than half the days	Nearly every day
1. Feeling nervous, anxious, or on edge	0	1	2	3
2. Not being able to stop or control worrying	0	1	2	3
3. Worrying too much about different things	0	1	2	3
4. Trouble relaxing	0	1	2	3
5. Being so restless that it is hard to sit still	0	1	2	3
6. Becoming easily annoyed or irritable	0	1	2	3
7. Feeling afraid, as if something awful might happen	0	1	2	3

Column totals _____ + _____ + _____ + _____ =

Total score _____

If you checked any problems, how difficult have they made it for you to do your work, take care of things at home, or get along with other people?

Not difficult at all	Somewhat difficult	Very difficult	Extremely difficult
☐	☐	☐	☐

Appendix J

Peter's et al., Delusional Beliefs Inventory 21

Appendix

P.D.I.-21

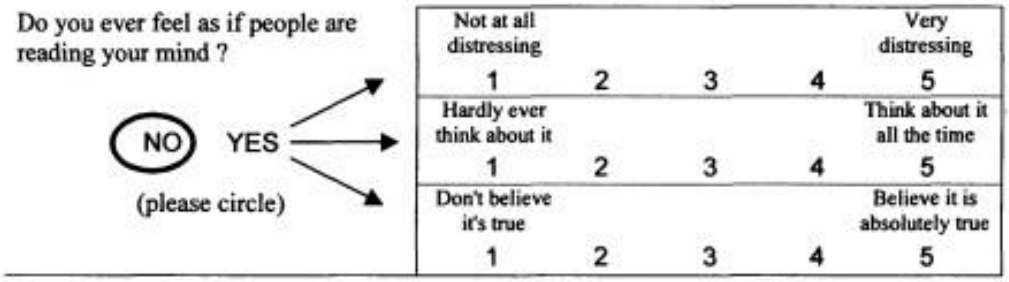
This questionnaire is designed to measure beliefs and vivid mental experiences. We believe that they are much more common than has previously been supposed, and that most people have had some such experiences during their lives. Please answer the following questions as honestly as you can. There are no right or wrong answers, and there are no trick questions.

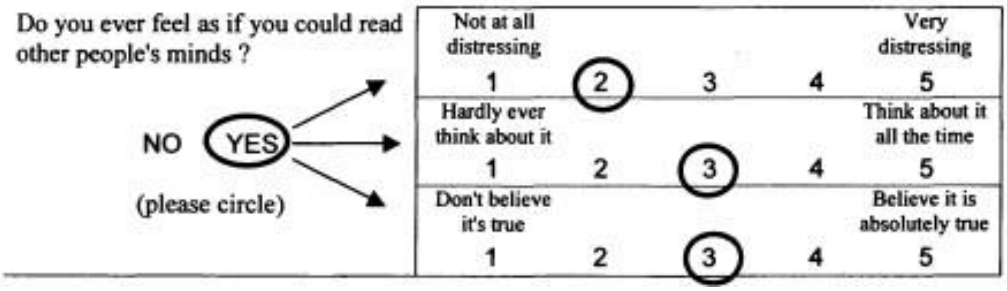
Please note that we are NOT interested in experiences people may have had when under the influence of drugs.

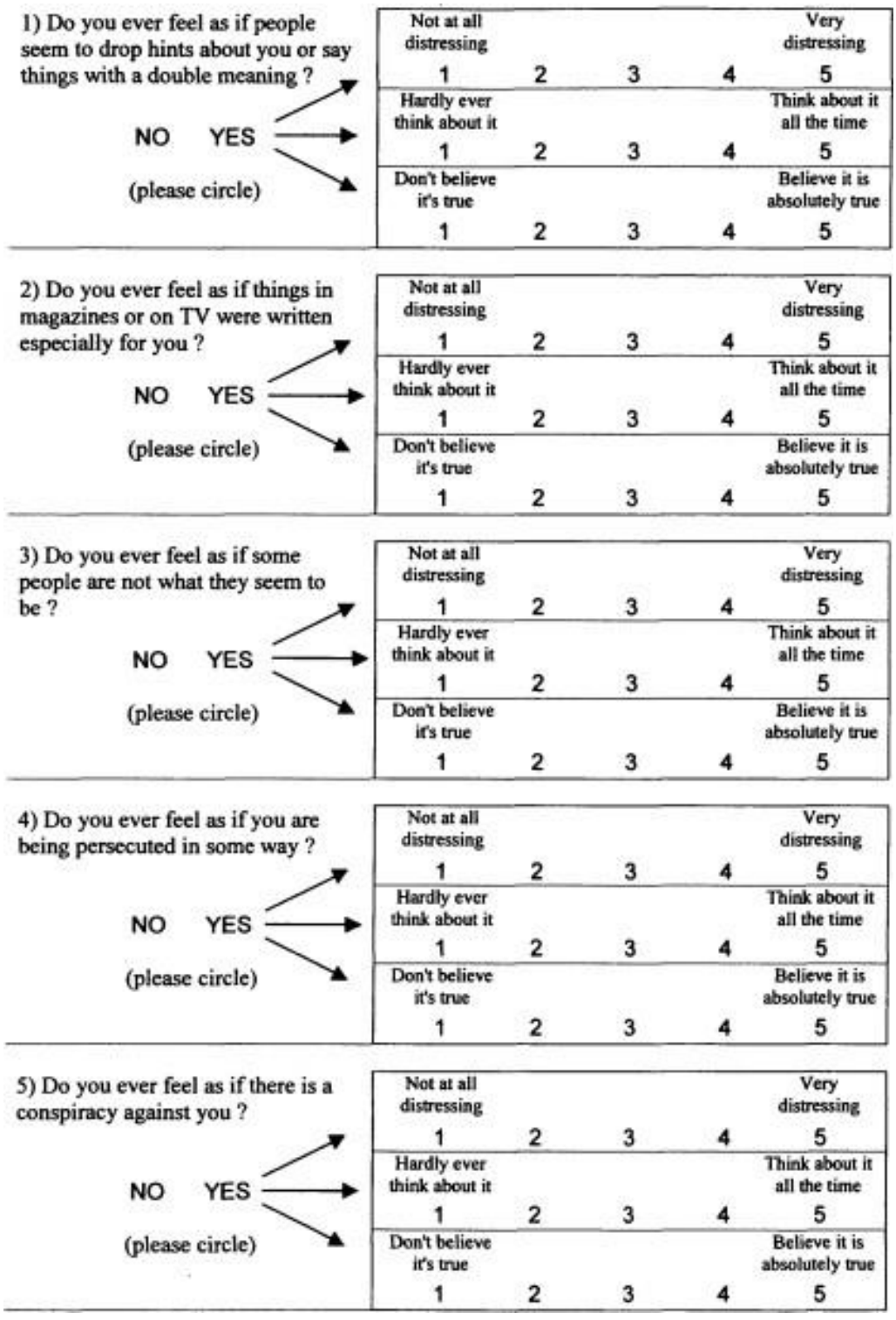
IT IS IMPORTANT THAT YOU ANSWER *ALL* QUESTIONS.

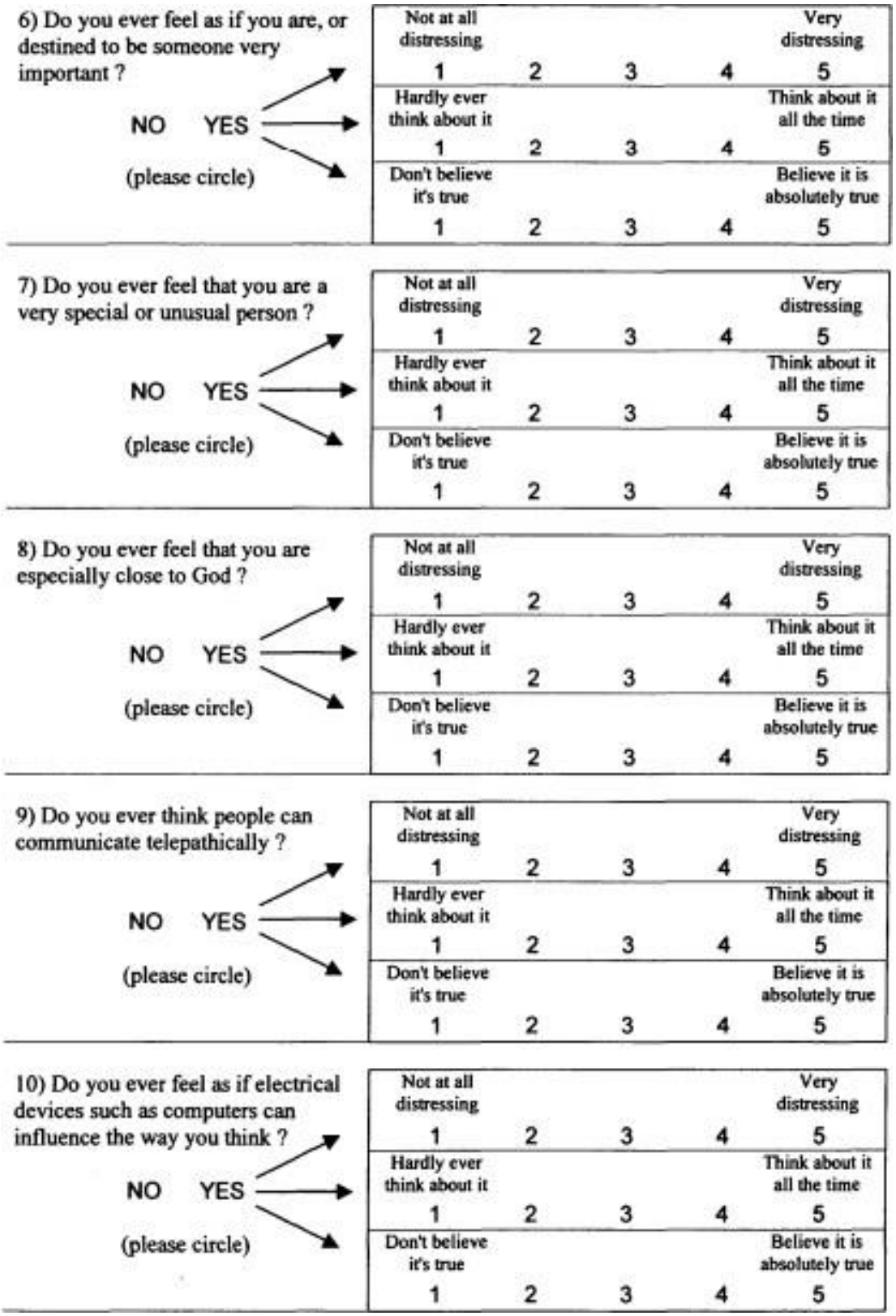
For the questions you answer YES to, we are interested in:
(a) how distressing these beliefs or experiences are
(b) how often you think about them; and
(c) how true you believe them to be.
On the right hand side of the page we would like you to circle the number which corresponds most closely to how distressing this belief is, how often you think about it, and how much you believe that it is true.
If you answer NO please move on to the next question.

Example






1) Do you ever feel as if people seem to drop hints about you or say things with a double meaning ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
2) Do you ever feel as if things in magazines or on TV were written especially for you ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
3) Do you ever feel as if some people are not what they seem to be ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
4) Do you ever feel as if you are being persecuted in some way ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
5) Do you ever feel as if there is a conspiracy against you ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5


6) Do you ever feel as if you are, or destined to be someone very important ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
7) Do you ever feel that you are a very special or unusual person ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
8) Do you ever feel that you are especially close to God ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
9) Do you ever think people can communicate telepathically ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5
10) Do you ever feel as if electrical devices such as computers can influence the way you think ?
NO YES
(please circle)
Not at all distressing
Very distressing
1 2 3 4 5
Hardly ever think about it
Think about it all the time
1 2 3 4 5
Don't believe it's true
Believe it is absolutely true
1 2 3 4 5

11) Do you ever feel as if you have been chosen by God in some way ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

12) Do you believe in the power of witchcraft, voodoo or the occult ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

13) Are you often worried that your partner may be unfaithful ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

14) Do you ever feel that you have sinned more than the average person ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

15) Do you ever feel that people look at you oddly because of your appearance ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

16) Do you ever feel as if you had no thoughts in your head at all ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

17) Do you ever feel as if the world is about to end ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

18) Do your thoughts ever feel alien to you in some way ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

19) Have your thoughts ever been so vivid that you were worried other people would hear them ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

20) Do you ever feel as if your own thoughts were being echoed back to you ?

NO YES

(please circle)

Not at all distressing				Very distressing
1	2	3	4	5
Hardly ever think about it				Think about it all the time
1	2	3	4	5
Don't believe it's true				Believe it is absolutely true
1	2	3	4	5

21) Do you ever feel as if you are a robot or zombie without a will of your own ? NO YES (please circle)	Not at all distressing				Very distressing
	1	2	3	4	5
	Hardly ever think about it				Think about it all the time
	1	2	3	4	5
	Don't believe it's true				Believe it is absolutely true
	1	2	3	4	5

Appendix K

The Adapted Structured Clinical Interview - Positive and Negative Syndrome Scale

Patient ID		Date		Time	
Brief notes					

Section 1: Build Rapport
(Instruction to the interviewer: Allow at least 5 minutes for a non-directive phase serving to establish rapport in the context of an overview before proceeding to the specific questions listed below.)
Section 2: Delusions and Unusual Thought Content
1. Have things been going well for you?
2. Has anything been bothering you lately? *
3. Can you tell me something about your thoughts on life and its purpose?*
4. Do you follow a particular philosophy (any special rules, teachings, or religious doctrine)?

5. Some people tell me they believe in the Devil; what do you think? **IF YES:** a. Can you tell me more about this?
6. Can you read other people's minds? **IF YES:** a. How does that work?
7. Can others read your mind? **IF YES:** a. How can they do that? b. Is there any reason that someone would want to read your mind?
8. Who controls your thoughts?
Section 3: Suspiciousness/Persecution and Poor Impulse Control
9. How do you spend your time these days?
10. Do you prefer to be alone?
11. Do you join in activities with others?

IF YES a. Tell me about it.	**IF NO** a. Why not? ... Are you afraid of people, or do you dislike them? **IF YES** b. Can you explain?

12. Do you have many friends?

IF YES
a. Close friends?
IF NO
a. Why not?

IF NO
Just a few?

IF NO
Any? ..... Why?

IF YES
Why just a few friends?

13. Do you feel that you can trust most people?
IF NO
a. Why not?

14. Are there some people in particular who you don't trust?

IF YES
a. Can you tell me who they are?

<u>Do 15</u>

IF NO and yes prev (can trust most people)
<u>Skip 15</u>

IF NO and no to prev (can't trust most people)
<u>Do 15</u>

15. Why don't you trust people (or name specific person)?
IF DONT KNOW OR DONT WANT TO SAY
a. Do you have a good reason not to trust…?
b. Is there something that ..(they).. did to you?
c. Perhaps something that ..(they).. might do to you now?
IF YES
d. Can you explain to me?

16. Do you get along well with others?
IF NO
a. What's the problem?

17. Do you have a quick temper?

18. Do you like most people?* **IF NO** a. Why not?
19. Are there perhaps some people who don't like you? **IF YES** a. For what reason?
20. Do others talk about you behind your back? **IF YES** a. What do they say about you? b. Why?
21. Does anyone ever spy on you or plot against you?
22. Do you sometimes feel in danger? **IF YES** a. Would you say that your life is in danger? b. Is someone thinking of harming you or even perhaps thinking of killing you? c. Have you gone to the police for help? d. Do you sometimes take matters into your own hands or take action against those who might harm you? **IF YES** e. What have you done?
Section 4: "Guilt Feelings" (G3) and "Grandiosity" (P5)
23. If you were to compare yourself to the average person, how would you come out: a little better, maybe a little worse, or about the same?

A. "BETTER,"	**B. "ABOUT THE SAME,"**	**C. "WORSE,"**
Better in what ways?		Worse in what ways?

	Are you special in some ways? **IF YES** In what ways?	Just how do you feel about yourself?
24. Would you consider yourself gifted?		
25. Do you have talents or abilities that most people don't have? **IF YES** a. Please explain.		
26. Do you have any special powers?* **IF YES** a. What are these? b. Where do these powers come from?		
27. Do you have extrasensory perception (ESP)?		
28. Are you very wealthy? **IF YES:** a. Please explain		
29. Can you be considered to be very bright? **IF YES** a. Why would you say so?		

30. Would you describe yourself as famous?

31. Would some people recognize you from TV, radio, or the newspaper?

IF YES,
a. Can you tell me about it?

32. Are you a religious person?

IF YES
a. Are you close to God?

IF YES
b. Did God assign you some special role or purpose?
b. Can you be one of God's messengers or angels?

IF YES	**IF NO:**
a. What special powers do you have as God's messenger (angel)?	b. Do you perhaps consider yourself to be God?

33. Do you have some special mission in life?
IF YES,
a. What is your mission?
b. Who assigned you to that mission?

34. Did you ever do something wrong — something you feel bad or guilty about?

IF YES
a. Just how much does that bother you now?
b. Do you feel that you deserve punishment for that?

IF YES
c. What kind of punishment would you deserve?
c. Have you at times thought of punishing yourself?

IF YES
e. Have you ever acted on those thoughts of punishing yourself?

Appendix L

Cohen's Social Network Index

Social Network Index

Instructions: This questionnaire is concerned with how many people you see or talk to on a regular basis including family, friends, workmates, neighbors, etc. Please read and answer each question carefully. Answer follow-up questions where appropriate.

1. Which of the following best describes your marital status?
   ___(1) currently married & living together, or living with someone in marital-like relationship
   ___(2) never married & never lived with someone in a marital-like relationship
   ___(3) separated
   ___(4) divorced or formerly lived with someone in a marital-like relationship
   ___(5) widowed

2. How many children do you have? (If you don't have any children, check '0' and skip to question 3.)

___0 ___1 ___2 ___3 ___4 ___5 ___6 ___7 or more

2a. How many of your children do you see or talk to on the phone at least once every 2 weeks?

___0 ___1 ___2 ___3 ___4 ___5 ___6 ___7 or more

3. Are either of your parents living? (If neither is living, check '0' and skip to question 4.)

___ (0) neither ___ (1) mother only ___ (2) father only ___ (3) both

3a. Do you see or talk on the phone to either of your parents at least once every 2 weeks?

___ (0) neither ___ (1) mother only ___ (2) father only ___ (3) both

4. Are either of your in-laws (or partner's parents) living? (If you have none, check the appropriate space and skip to question 5.)

___ (0) neither ___ (1) mother only ___ (2) father only ___ (3) both ___ (4) not applicable

4a. Do you see or talk on the phone to either of your partner's parents at least once every 2 weeks?

___ (0) neither ___ (1) mother only ___ (2) father only ___ (3) both

5. How many other relatives (other than your spouse, parents & children) do you feel close to? (If '0', check that space and skip to question 6.)

___0 ___1 ___2 ___3 ___4 ___5 ___6 ___7 or more

5a. How many of these relatives do you see or talk to on the phone at least once every 2 weeks?

___0 ___1 ___2 ___3 ___4 ___5 ___6 ___7 or more

6. How many close friends do you have? (meaning people that you feel at ease with, can talk to about private matters, and can call on for help)

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

6a. How many of these friends do you see or talk to at least once every 2 weeks?

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

7. Do you belong to a church, temple, or other religious group? (If not, check 'no' and skip to question 8.)

_____ no _____ yes

7a. How many members of your church or religious group do you talk to at least once every 2 weeks? (This includes at group meetings and services.)

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

8. Do you attend any classes (school, university, technical training, or adult education) on a regular basis? (If not, check 'no' and skip to question 9.)

_____ no _____ yes

8a. How many fellow students or teachers do you talk to at least once every 2 weeks? (This includes at class meetings.)

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

9. Are you currently employed either full or part-time? (If not, check 'no' and skip to question 10.)

____ (0) no _____ (1) yes, self-employed _____ (2) yes, employed by others

9a. How many people do you supervise?

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

9b. How many people at work (other than those you supervise) do you talk to at least once every 2 weeks?

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

10. How many of your neighbors do you visit or talk to at least once every 2 weeks?

_____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

11. Are you currently involved in regular volunteer work? (If not, check 'no' and skip to question 12.)

_____ no _____ yes

11a. How many people involved in this volunteer work do you talk to about volunteering-related issues at least once every 2 weeks?

____0 ____1 ____2 ____3 ____4 ____5 ____6 ____7 or more

12. Do you belong to any groups in which you talk to one or more members of the group about group-related issues at least once every 2 weeks? Examples include social clubs, recreational groups, trade unions, commercial groups, professional organizations, groups concerned with children like the PTA or Boy Scouts, groups concerned with community service, etc. (If you don't belong to any such groups, check 'no' and skip the section below.)

_____ no _____ yes

Consider those groups in which you talk to a fellow group member at least once every 2 weeks. Please provide the following information for each such group: the name or type of group and the total number of members in that group that you talk to at least once every 2 weeks.

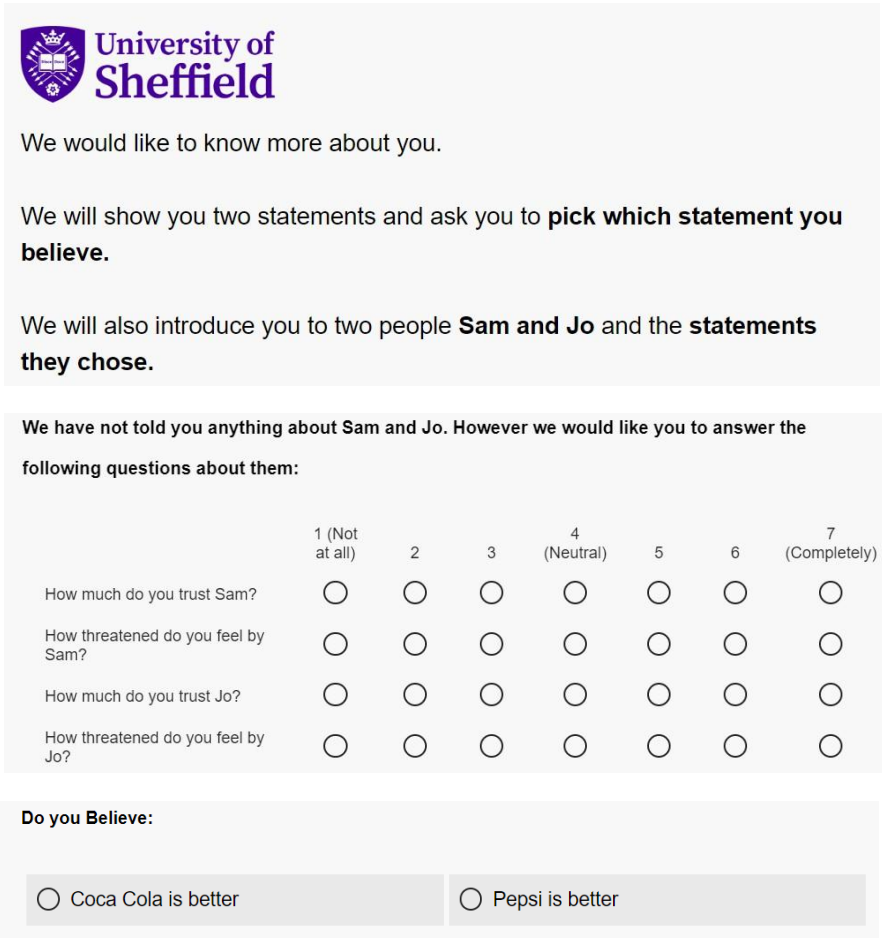
Group	Total number of group members that you talk to at least once every 2 weeks
1.	
2.	
3.	
4.	
5.	
6.	

This scale was used for the following journal article:

Cohen, S., Doyle, W. J., Skoner, D. P., Rabin, B. S., & Gwaltney, J. M. Jr. (1997). Social ties and susceptibility to the common cold. Journal of the American Medical Association, 277, 1940-1944. Link to full-text (pdf)

Appendix M

AB Game



University of Sheffield

We would like to know more about you.

We will show you two statements and ask you to **pick which statement you believe.**

We will also introduce you to two people **Sam and Jo** and the **statements they chose.**

We have not told you anything about Sam and Jo. However we would like you to answer the following questions about them:

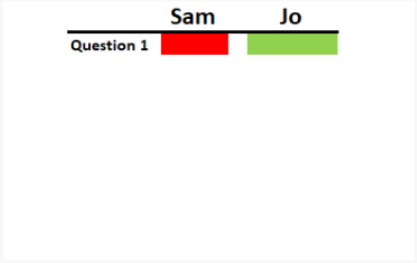
	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
How much do you trust Sam?	◯	◯	◯	◯	◯	◯	◯
How threatened do you feel by Sam?	◯	◯	◯	◯	◯	◯	◯
How much do you trust Jo?	◯	◯	◯	◯	◯	◯	◯
How threatened do you feel by Jo?	◯	◯	◯	◯	◯	◯	◯

Do you Believe:

◯ Coca Cola is better ◯ Pepsi is better

Jo agrees with you

Sam does not agree with you



Who agreed with you?

- ◯ Sam
- ◯ Jo

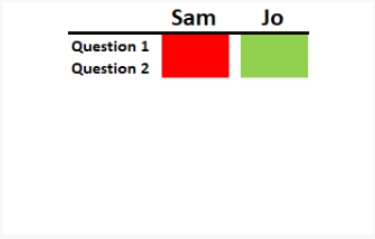
Do you believe:

- ◯ Ready Salted Crisps are better
- ◯ Salt and Vinegar crisps are better

→

Jo agrees with you

Sam does not agree with you



Who agreed with you?

- ◯ Sam
- ◯ Jo

Do you believe:

◯ Summer is better ◯ Winter is better

Jo agrees with you

Sam does not agree with you

Who agreed with you?

◯ Sam

◯ Jo

Do you believe:

◯ Yoghurt is better ◯ Cheese is better

Sam agrees with you

Jo does not agree with you

Who agreed with you?

◯ Sam

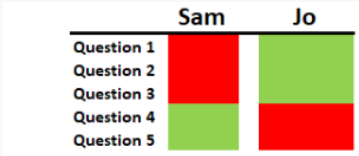
◯ Jo

Do you believe:

◯ Apples are better ◯ Pears are better

Sam agrees with you

Jo does not agree with you



Who agreed with you?

◯ Sam

◯ Jo

Do you believe:

◯ Dogs are better ◯ Cats are better

Jo agrees with you

Sam does not agree with you

Who agreed with you?

◯ Sam

◯ Jo

Do you believe:

◯ Morning is better ◯ Evening is better

Jo agrees with you

Sam does not agree with you

Who agreed with you?

◯ Sam

◯ Jo

Do you believe:

◯ Pasta is better ◯ Rice is better

Jo agrees with you

Sam does not agree with you

Who agreed with you?

◯ Sam

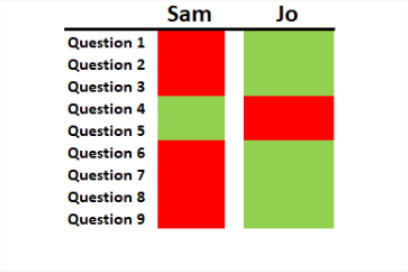
◯ Jo

Do you believe:

◯ Netflix is better ◯ Amazon Prime is better

Jo agrees with you

Sam does not agree with you



Who agreed with you?

- ◯ Sam
- ◯ Jo

Do you believe:

- ◯ Being indoors is better
- ◯ Being outdoors is better

Jo agrees with you

Sam does not agree with you

Who agreed with you?

- ◯ Sam
- ◯ Jo

We have asked Jo and Sam a mystery question.

Sam chose mystery item B

Jo chose mystery item A

Which mystery item would you pick?

◯ Mystery Item A	◯ Mystery Item B

Please answer the following questions about Jo and Sam:

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
How much do you trust Jo?	◯	◯	◯	◯	◯	◯	◯
How threatened do you feel by Jo?	◯	◯	◯	◯	◯	◯	◯
How much do you trust Sam?	◯	◯	◯	◯	◯	◯	◯
How threatened do you feel by Sam?	◯	◯	◯	◯	◯	◯	◯

→

This Game was repeated with Political, Conspiracy and Paranoid Beliefs.

An example of each question is shown below:

Political Beliefs

Thank you for answering the questions.

We will now show you a few more statements and ask you to **pick which statement you believe.**

We will also introduce you to two different people **Alex and Max** and the **statements that they chose.**

Do you believe:

◯ The death penalty should exist ◯ The death penalty should not exist

→

Alex agrees with you

Max does not agree with you

Who agreed with you?

◯ Alex

◯ Max

Conspiracy Theories

Thank you for answering the questions. We will now show you a few more statements and ask you to **pick which statement you believe.**

We will also introduce you to two different people **Morgan and Charlie** and the **statements that they chose.**

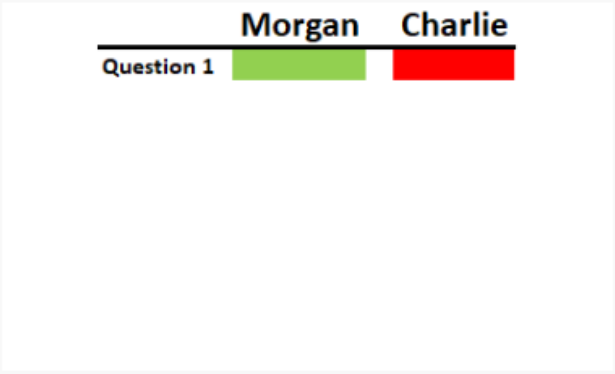
Do you believe:

- ◯ The Earth is flat
- ◯ The Earth is round

→

Morgan agrees with you

Charlie does not agree with you



Who agreed with you?

- ◯ Morgan
- ◯ Charlie

Paranoid Beliefs

Thank you for answering the questions. We will now show you a few more statements and ask you to **pick which statement you believe.**

We will also introduce you to two different people **Frankie and Tyler** and the statements that they chose.

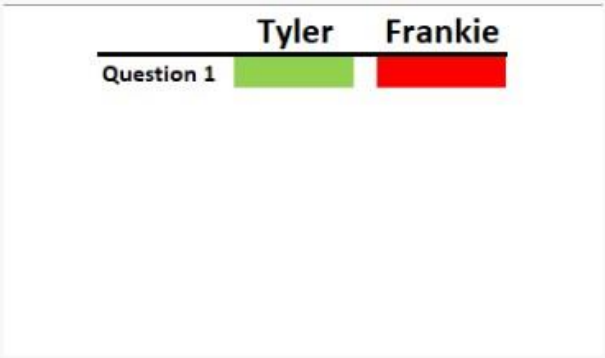
Do you believe:

- ◯ People can read your mind
- ◯ People cannot read your mind

→

Tyler agrees with you

Frankie does not agree with you



Who agreed with you?

- ◯ Tyler
- ◯ Frankie

Appendix N

Belief Exploration Task

Neutral Beliefs

We would like to know a little bit about your beliefs.

We will show you a statement and ask you some questions related to it.

Please answer all questions.

Gravity keeps us on the ground

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Silk is soft

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Paper comes from trees

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Eye colour is genetic

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Forests have trees

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

How threatened would you feel sharing these beliefs with others?

Please rate your answer on the scale below

1 (no threat)	2	3	4 (Neutral)	5	6	7 (Completely threatened)
◯	◯	◯	◯	◯	◯	◯

Rate your level of trust in sharing these beliefs with others?

Please rate your answer on the scale below

1 (no trust)	2	3	4 (Neutral)	5	6	7 (Completely trust)
◯	◯	◯	◯	◯	◯	◯

Paranoid Beliefs

We would now like to ask you some more questions about your beliefs. We will show you a statement and ask you some questions related to it.

Please answer all questions.

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Certain individuals have it in for me

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

People want me to feel threatened, so they stare at me

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

I am persecuted by others (subject to unfriendly behaviour and ill-treatment)

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

How threatened would you feel sharing these beliefs with others?

Please rate your answer on the scale below

1 (no threat)	2	3	4 (Neutral)	5	6	7 (completely threatened)
◯	◯	◯	◯	◯	◯	◯

Rate your level of trust in sharing these beliefs with others?

Please rate your answer on the scale below

1 (no trust)	2	3	4 (Neutral)	5	6	7 (complete trust)
◯	◯	◯	◯	◯	◯	◯

Conspiracy Beliefs

We would now like to ask you some more questions about your beliefs. We will show you a statement and ask you some questions related to it.

Please answer all questions.

The earth is flat

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Humans set foot on the moon

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

Hollywood celebrities and billionaires are part of a paedophile ring

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

The COVID-19 Vaccines are a form of population control

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

The Bermuda triangle is a wormhole portal that transports planes to another space and time

	1 (Not at all)	2	3	4 (Neutral)	5	6	7 (Completely)
In your opinion, how true do you think this belief is?	◯	◯	◯	◯	◯	◯	◯
How likely is it that others in your close circle will agree with you?	◯	◯	◯	◯	◯	◯	◯
How comfortable would you feel talking about this belief with others?	◯	◯	◯	◯	◯	◯	◯

How threatened would you feel sharing these beliefs with others?

Please rate your answer on the scale below

1 (no threat)	2	3	4 (Neutral)	5	6	7 (completely threatened)
◯	◯	◯	◯	◯	◯	◯

Rate your level of trust in sharing these beliefs with others?

Please rate your answer on the scale below

1 (no trust)	2	3	4 (Neutral)	5	6	7 (complete trust)
◯	◯	◯	◯	◯	◯	◯

Appendix O

Phase one information sheet and consent form

Title: Belief Formation in Deluded and Non-Deluded People
IRAS ID: 325034
Version: 3
Date: 09.11.2023

We would like to invite you to take part in the following research.

In this research study we will use information from you. We will only use information that we need for the research study. We will let very few people know your name or contact details, and only if they really need it for this study.

Everyone involved in this study will keep your data safe and secure. We will also follow all privacy rules.
At the end of the study we will save some of the data in case we need to check it and for future research.
We will make sure no-one can work out who you are from the reports we write.

The information that follows will tell you more about this.
Please take your time to read through it as it is important that you understand why we plan on conducting the research and what we will ask you to do if you agree to take part.

What is the purpose of this project?

Our names are Daisy Fitzpatrick and Jessica Twigg, and we are conducting this research project as part of our Doctorate of Clinical Psychology at The University of Sheffield. The University of Sheffield is the sponsor for this research.

This study aims to explore:

(1) The thought processes associated with how people form groups with others, how we cooperate within these groups, how we share beliefs with others and whether these processes are influenced by feelings of threat and trust. We will then look at whether these differ in people who have experienced delusional thoughts and those who haven't.

(2) The link between accuracy on questions and how certain someone is about an answer. To see if threat-based questions impact judgements of certainty. To look at if experiencing delusional beliefs is linked with an impacted judgement of certainty.

What will this research involve?

The study can be accessed online. There are two phases to this project.

Phase 1: phase 1 will take approximately 30-50 minutes to complete. You can access phase 1 directly after providing consent. You will then be asked to provide some personal details about you and complete some questionnaires that look at anxiety, depression, and beliefs.

We may invite you to take part in phase 2 if you meet the criteria for the study.

Phase 2: you will be asked to complete a series of questionnaires and play three short games. This phase will take approximately 55-85 minutes to complete.

The games are:

(1) AB Game: In this game you will be asked about your attitudes towards various objects e.g. soft drinks and beliefs. You will also learn about the attitudes of other people and be asked to say how similar you feel to them.

(2) Belief Exploration Task: This game will explore your beliefs, whether you think other people share them, and who you like to discuss them with.

(3) Millionaires Game: This game will involve answering some general knowledge questions by selecting a response from a choice of four answers. You will then be asked to rate your confidence in your answer and tell us how difficult you think the question was.

Benefits of taking part?
As a thank you for taking part:

If you take part in phase 1, with your consent will add you to a prize draw for a chance to win a £20 voucher.

If you take part in phase 2, you will also receive a £10 voucher as a thank you.

If you would like to be considered for phase 2 you will be asked to provide contact details in the next section.

Next we will tell you more information about how we will use your data and ask for you to consent to taking part.

How will we use information about you?
We will need to use information from you for this research project.
This information will include your:

- Name
- Email address (if provided)
- Phone number (if provided)
- Any mental health diagnoses
- Any psychiatric treatment you have received
- Any psychiatric medication you take
- Age (in years)
- Gender
- Ethnicity
- Religion
- Responses to questions

People will use this information to do the research or to check your records to make sure that the research is being done properly.
People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead. We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

What are your choices about how your information is used?

- You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.
- We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how your information is used?

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- a leaflet available from https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/data-protection-and-information-governance/gdpr-guidance/templates/template-wording-for-generic-information-document/
- By sending an email to one of the research team researchers: Daisy Fitzpatrick (dfitzpatrick1@sheffield.ac.uk) or Jessica Twigg (jtwigg1@sheffield.ac.uk)
- By emailing the project supervisor: Professor Richard Bentall (r.bentall@sheffield.ac.uk)
- or by emailing Amrit Sinha, Research Support Officer/Data Protection Officer: Amrit Sinha (a.sinha@sheffield.ac.uk)
- or calling 0114222 6650

Further information

Further information This research has been reviewed and approved by the NHS Wales Rec 6 (IRAS ID: 325034) and the University of Sheffield. This research will be used to write a thesis which fulfils part of the researcher's doctoral training. Please note you can contact the researchers if you would like to receive a summary of the findings.

Thank you for taking the time to read this information.

Consenting to take part

Title: Belief Formation in Deluded and Non-Deluded People
IRAS ID: 325034
Version: 3
Date: 09.11.23

Please indicate your response to the following:

	Yes	No
I confirm that I have read the information sheet (version 2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	○	○
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.	○	○
I understand that the information collected about me will be used to support other research in the future, and may be shared anonymously with other researchers.	○	○
I agree to take part in the above study.	○	○

Please write your full name:

If you want to be contacted with information about phase 2 please provide either your telephone number or email below:

Please provide a phone number in the box

Please provide an email address in the box

What if I wish to make a complaint about the way the study has been carried out?

If you wish to make a complaint or raise any concerns about this study and do not want to speak to any of the researchers, their supervisor, or the research support officer you can do this by:

- Emailing Dr Liza Monaghan (Head of Department) at l.monaghan@sheffield.ac.uk

You can also contact PALS to make a complaint. If you would like to make a complaint through PALS you can do so by:

- Writing to: Complaints Team, Sheffield Health and Social Care NHS Foundation Trust, Centre Court, Atlas Way Sheffield, S4 7QQ
- Emailing: complaints@shsc.nhs.uk or
- Calling: 0114 2718956

Further information about the PALS complaint process can be found at https://www.shsc.nhs.uk/contact-us/complaints

Appendix P

Test Battery Order

This battery was conducted for the larger study (not just coalitional cognition)

Phase 1

1. Informed Consent

2. Screening Battery
   a. Demographics Questionnaire
   b. PDI- 21
   c. GAD-7
   d. PHQ-9
   e. MDBS

3. Screening scores analysed and next steps established:
   a. If suitable (met inclusion criteria and recruitment to the group is still ongoing) participants will be invited to complete phase 2
   b. If not suitable debrief
   c. Everyone who completes phase 1 is entered into a prize draw for a voucher (£20)

Phase 2

1. Informed Consent

2. Experimental Battery
   a. PANSS
   b. CSNI
   c. AB Game
   d. Reaction Time General Knowledge Quiz
   e. Belief Exploration Task

3. Debrief (inc. invitation to ask for findings to be sent) and payment (£10 voucher).

Appendix Q

Phase two information sheet and consent form

Title: Belief Formation in Deluded and Non-Deluded People
IRAS ID: 325034
Version: 3
Date: 09.11.2023

Thank you for your participation in the previous part of this study

In this research study we will use information from you. We will only use information that we need for the research study. We will let very few people know your name or contact details, and only if they really need it for this study.

Everyone involved in this study will keep your data safe and secure. We will also follow all privacy rules. At the end of the study we will save some of the data in case we need to check it and for future research. We will make sure no-one can work out who you are from the reports we write.

The information that follows will tell you more about this.
Please take your time to read through it as it is important that you understand why we plan on conducting the research and what we will ask you to do if you agree to take part.

Thank you for meeting one of our researchers online.

What is the purpose of this project?
Our names are Daisy Fitzpatrick and Jessica Twigg, and we are conducting this research project as part of our Doctorate of Clinical Psychology at The University of Sheffield. The University of Sheffield is the sponsor for this research.

This study aims to explore:
(1) The thought processes associated with how people form groups with others, how we cooperate within these groups, how we share beliefs with others and whether these processes are influenced by feelings of threat and trust. We will then look at whether these differ in people who have experienced delusional thoughts and those who haven't.

(2) The link between accuracy on questions and how certain someone is about an answer. To see if threat-based questions impact judgements of certainty. To look at if experiencing delusional beliefs is linked with an impacted judgement of certainty.

What will this research involve?
There are two phases to this project and this online questionnaire relates to phase 2.

Before you begin phase 2, you will be asked to answer some questions to confirm your eligibility to continue.

Then in phase 2 you will be asked to complete further questionnaires and play three short games. This phase will take approximately 55-85 minutes to complete.

The games are:
(1) AB Game: In this game you will be asked about your attitudes towards various objects e.g. soft drinks and beliefs. You will also learn about the attitudes of other people and be asked to say how similar you feel to them.

(2) Belief Exploration Task: This game will explore your beliefs, whether you think other people share them, and who you like to discuss them with.

(3) Millionaires Game: This game will involve answering some general knowledge questions by selecting a response from a choice of four answers. You will then be asked to rate your confidence in your answer and tell us how difficult you think the question was.

Once you have completed phase 2, the study will end, and you will be debriefed by the researcher.

Benefits of taking part?
You will receive a £10 voucher as a thank you for meeting with us today.

Next we will tell you more information about how we will use your data and ask for you to consent to taking part.

How will we use information about you?
We will need to use information from you for this research project.
This information will include your:

- Name
- Email address (if provided)
- Phone number (if provided)
- Any mental health diagnoses
- Any psychiatric treatment you have received
- Any psychiatric medication you take
- Age (in years)
- Gender
- Ethnicity
- Religion
- Responses to questions

People will use this information to do the research or to check your records to make sure that the research is being done properly.
People who do not need to know who you are will not be able to see your name or contact details. Your data will have a code number instead. We will keep all information about you safe and secure.

Once we have finished the study, we will keep some of the data so we can check the results. We will write our reports in a way that no-one can work out that you took part in the study.

What are your choices about how your information is used?

- You can stop being part of the study at any time, without giving a reason, but we will keep information about you that we already have.
- We need to manage your records in specific ways for the research to be reliable. This means that we won't be able to let you see or change the data we hold about you.

Where can you find out more about how your information is used?

You can find out more about how we use your information

- at www.hra.nhs.uk/information-about-patients/
- a leaflet available from https://www.hra.nhs.uk/planning-and-improving-research/policies-standards-legislation/data-protection-and-information-governance/gdpr-guidance/templates/template-wording-for-generic-information-document/
- By sending an email to one of the research team researchers: Daisy Fitzpatrick (dfitzpatrick1@sheffield.ac.uk) or Jessica Twigg (jtwigg1@sheffield.ac.uk)
- By emailing the project supervisor: Professor Richard Bentall (r.bentall@sheffield.ac.uk)
- or by emailing Amrit Sinha, Research Support Officer/Data Protection Officer: Amrit Sinha (a.sinha@sheffield.ac.uk)
- or calling 0114222 6650

Further information

Further information This research has been reviewed and approved by the NHS Wales Rec 6 (IRAS ID: 325034) and the University of Sheffield. This research will be used to write a thesis which fulfils part of the researcher's doctoral training. Please note you can contact the researchers if you would like to receive a summary of the findings.

Thank you for taking the time to read this information.

Consenting to take part
Title: Belief Formation in Deluded and Non-Deluded People
IRAS ID: 325034
Version: 3
Date: 09.11.23

Thank you for taking the time to read the previous information.
Please write your name and then answer the following statements.

Name:

Please indicate your response to the following:

	Yes	No
I confirm that I have read the information sheet (version 2) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily.	○	○
I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected.	○	○
I understand that the information collected about me will be used to support other research in the future, and may be shared anonymously with other researchers.	○	○
I agree to take part in the above study.	○	○

What if I wish to make a complaint about the way the study has been carried out?

If you wish to make a complaint or raise any concerns about this study and do not want to speak to any of the researchers, their supervisor, or the research support officer you can do this by:

- Emailing Dr Liza Monaghan (Head of Department) at l.monaghan@sheffield.ac.uk

You can also contact PALS to make a complaint. If you would like to make a complaint through PALS you can do so by:

- Writing to: Complaints Team, Sheffield Health and Social Care NHS Foundation Trust, Centre Court, Atlas Way Sheffield, S4 7QQ
- Emailing: complaints@shsc.nhs.uk or
- Calling: 0114 2718956

Further information about the PALS complaint process can be found at https://www.shsc.nhs.uk/contact-us/complaints

Appendix R

SPSS Analysis output

Participant Demographics

Age

Descriptives

Age (Years)

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	29.5909	6.80097	1.44997	26.5755	32.6063	18.00	49.00
MH	22	33.1818	10.86557	2.31655	28.3643	37.9993	21.00	65.00
Gen	22	33.8636	10.49397	2.23732	29.2109	38.5164	25.00	60.00
Total	66	32.2121	9.60371	1.18213	29.8512	34.5730	18.00	65.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Age (Years)	Based on Mean	1.471	2	63	.237
	Based on Median	.585	2	63	.560
	Based on Median and with adjusted df	.585	2	53.057	.560
	Based on trimmed mean	1.066	2	63	.351

ANOVA

Age (Years)

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	231.848	2	115.924	1.267	.289
Within Groups	5763.182	63	91.479		
Total	5995.030	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Age (Years)	Eta-squared	.039	.000	.145
	Epsilon-squared	.008	-.032	.118
	Omega-squared Fixed-effect	.008	-.031	.116
	Omega-squared Random-effect	.004	-.015	.062

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Age (Years)

	Statistic[a]	df1	df2	Sig.
Welch	1.652	2	39.854	.205

a. Asymptotically F distributed.

Gender

Crosstab

Count

		Group Number (1,2,3)			
		Delusion	MH	Gen	Total
Gender Type	Male	10a	9a	6a	25
	Female	12a	12a	16a	40
	Non-Binary / Third Gender	0a	1a	0a	1
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.840[a]	4	.428
Likelihood Ratio	4.064	4	.397
Linear-by-Linear Association	1.368	1	.242
N of Valid Cases	66		

a. 3 cells (33.3%) have expected count less than 5. The minimum expected count is .33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.241	.428
	Cramer's V	.171	.428
N of Valid Cases		66	

Crosstab

Count

		Group Number (1,2,3)			
		Delusion	MH	Gen	Total
Religion by type	Christian	11a	6a	6a	23
	Buddhist	0a	0a	1a	1
	Other Religion	2a	0a	0a	2
	Atheism	1a	6a	3a	10
	Agnostic	0a	3a	2a	5
	No religion	7a	7a	10a	24
	Prefer not to say	1a	0a	0a	1
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Ethnicity

Crosstab

Count

		Group Number (1,2,3)			
		Delusion	MH	Gen	Total
Ethnicity by type	Asian	2a	0a	0a	2
	Black, Clack British, Caribeean	10a	1b	0b	11
	Mixed	0a	2a	2a	4
	White	10a	18b	20b	48
	Other	0a	1a	0a	1
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	28.045[a]	8	<.001
Likelihood Ratio	31.069	8	<.001
N of Valid Cases	66		

a. 12 cells (80.0%) have expected count less than 5. The minimum expected count is .33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.652	<.001
	Cramer's V	.461	<.001
N of Valid Cases		66	

Religion

Crosstab

Count

		Group Number (1,2,3)			
		Delusion	MH	Gen	Total
Religion by type	Christian	11a	6a	6a	23
	Buddhist	0a	0a	1a	1
	Other Religion	2a	0a	0a	2
	Atheism	1a	6a	3a	10
	Agnostic	0a	3a	2a	5
	No religion	7a	7a	10a	24
	Prefer not to say	1a	0a	0a	1
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	17.524[a]	12	.131
Likelihood Ratio	19.842	12	.070
Linear-by-Linear Association	1.790	1	.181
N of Valid Cases	66		

a. 15 cells (71.4%) have expected count less than 5. The minimum expected count is .33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.515	.131
	Cramer's V	.364	.131
N of Valid Cases		66	

Mental Health Diagnoses

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Diagnosis (Yes,No) * Group Number (1,2,3)	66	100.0%	0	0.0%	66	100.0%
Treatment (Yes, No) * Group Number (1,2,3)	66	100.0%	0	0.0%	66	100.0%
Medication (Yes, No) * Group Number (1,2,3)	66	100.0%	0	0.0%	66	100.0%
Gender Type * Group Number (1,2,3)	66	100.0%	0	0.0%	66	100.0%
Religion by type * Group Number (1,2,3)	66	100.0%	0	0.0%	66	100.0%
Ethnicity by type * Group Number (1,2,3)	66	100.0%	0	0.0%	66	100.0%

Crosstab

Count

		Group Number (1,2,3)			
		Delusion	MH	Gen	Total
Diagnosis (Yes,No)	Yes	16a	15a	0b	31
	No	6a	7a	22b	35
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	29.320[a]	2	<.001
Likelihood Ratio	37.949	2	<.001
Linear-by-Linear Association	23.005	1	<.001
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.667	<.001
	Cramer's V	.667	<.001
N of Valid Cases		66	

Treatment

Crosstab

Count

		Group Number (1,2,3)			
		Delusion	MH	Gen	Total
Treatment (Yes, No)	Yes	15a	14a	2b	31
	No	7a	8a	20b	35
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	19.100[a]	2	<.001
Likelihood Ratio	21.486	2	<.001
Linear-by-Linear Association	15.187	1	<.001
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 10.33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.538	<.001
	Cramer's V	.538	<.001
N of Valid Cases		66	

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.538	<.001
	Cramer's V	.538	<.001
N of Valid Cases		66	

Medication

Crosstab

Count

		Group Number (1,2,3)			Total
		Delusion	MH	Gen	
Medication (Yes, No)	Yes	10[a]	11[a]	0[b]	21
	No	12[a]	11[a]	22[b]	45
Total		22	22	22	66

Each subscript letter denotes a subset of Group Number (1,2,3) categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.505[a]	2	<.001
Likelihood Ratio	21.750	2	<.001
Linear-by-Linear Association	10.317	1	.001
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 7.00.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.485	<.001
	Cramer's V	.485	<.001
N of Valid Cases		66	

Screening Variables

Anxiety

Descriptives

Anxiety total score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	9.6364	4.63471	.98812	7.5814	11.6913	2.00	18.00
MH	22	9.9545	3.19936	.68211	8.5360	11.3731	4.00	16.00
Gen	22	3.0909	2.11365	.45063	2.1538	4.0281	.00	7.00
Total	66	7.5606	4.67441	.57538	6.4115	8.7097	.00	18.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Anxiety total score	Based on Mean	7.921	2	63	<.001
	Based on Median	6.952	2	63	.002
	Based on Median and with adjusted df	6.952	2	53.007	.002
	Based on trimmed mean	7.958	2	63	<.001

ANOVA

Anxiety total score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	660.394	2	330.197	27.377	<.001
Within Groups	759.864	63	12.061		
Total	1420.258	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Anxiety total score	Eta-squared	.465	.270	.586
	Epsilon-squared	.448	.247	.573
	Omega-squared Fixed-effect	.444	.244	.569
	Omega-squared Random-effect	.286	.139	.398

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Anxiety total score

	Statistic[a]	df1	df2	Sig.
Welch	43.389	2	38.455	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Anxiety total score

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-.31818	1.04713	.950	-2.8316	2.1953
		Gen	6.54545*	1.04713	<.001	4.0320	9.0589
	MH	Delusion	.31818	1.04713	.950	-2.1953	2.8316
		Gen	6.86364*	1.04713	<.001	4.3502	9.3771
	Gen	Delusion	-6.54545*	1.04713	<.001	-9.0589	-4.0320
		MH	-6.86364*	1.04713	<.001	-9.3771	-4.3502
Games-Howell	Delusion	MH	-.31818	1.20069	.962	-3.2486	2.6123
		Gen	6.54545*	1.08603	<.001	3.8652	9.2257
	MH	Delusion	.31818	1.20069	.962	-2.6123	3.2486
		Gen	6.86364*	.81752	<.001	4.8663	8.8610
	Gen	Delusion	-6.54545*	1.08603	<.001	-9.2257	-3.8652
		MH	-6.86364*	.81752	<.001	-8.8610	-4.8663

*. The mean difference is significant at the 0.05 level.

Anxiety total score

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Gen	22	3.0909	
	Delusion	22		9.6364
	MH	22		9.9545
	Sig.		1.000	.950

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Depression

Descriptives

Depression total score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	10.4545	6.04528	1.28886	7.7742	13.1349	1.00	24.00
MH	22	11.6364	6.29849	1.34284	8.8438	14.4290	3.00	25.00
Gen	22	2.3636	2.40130	.51196	1.2990	3.4283	.00	9.00
Total	66	8.1515	6.61291	.81399	6.5259	9.7772	.00	25.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Depression total score	Based on Mean	8.923	2	63	<.001
	Based on Median	8.786	2	63	<.001
	Based on Median and with adjusted df	8.786	2	51.967	<.001
	Based on trimmed mean	9.341	2	63	<.001

ANOVA

Depression total score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1120.848	2	560.424	20.508	<.001
Within Groups	1721.636	63	27.328		
Total	2842.485	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Depression total score	Eta-squared	.394	.197	.527
	Epsilon-squared	.375	.172	.512
	Omega-squared Fixed-effect	.372	.170	.508
	Omega-squared Random-effect	.228	.093	.341

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Depression total score

	Statistic[a]	df1	df2	Sig.
Welch	32.831	2	34.654	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Depression total score

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-1.18182	1.57617	.735	-4.9651	2.6015
		Gen	8.09091*	1.57617	<.001	4.3076	11.8742
	MH	Delusion	1.18182	1.57617	.735	-2.6015	4.9651
		Gen	9.27273*	1.57617	<.001	5.4894	13.0561
	Gen	Delusion	-8.09091*	1.57617	<.001	-11.8742	-4.3076
		MH	-9.27273*	1.57617	<.001	-13.0561	-5.4894
Games-Howell	Delusion	MH	-1.18182	1.86129	.802	-5.7041	3.3404
		Gen	8.09091*	1.38682	<.001	4.6558	11.5261
	MH	Delusion	1.18182	1.86129	.802	-3.3404	5.7041
		Gen	9.27273*	1.43713	<.001	5.7093	12.8361
	Gen	Delusion	-8.09091*	1.38682	<.001	-11.5261	-4.6558
		MH	-9.27273*	1.43713	<.001	-12.8361	-5.7093

*. The mean difference is significant at the 0.05 level.

Anxiety total score

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Gen	22	3.0909	
	Delusion	22		9.6364
	MH	22		9.9545
	Sig.		1.000	.950

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Delusion Distress

Descriptives

delusion total score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	110.8182	56.91400	12.13411	85.5839	136.0524	43.00	278.00
MH	22	30.7727	22.06901	4.70513	20.9879	40.5576	.00	70.00
Gen	22	16.6364	13.13137	2.79962	10.8142	22.4585	.00	38.00
Total	66	52.7424	54.82456	6.74844	39.2649	66.2200	.00	278.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
delusion total score	Based on Mean	12.575	2	63	<.001
	Based on Median	6.924	2	63	.002
	Based on Median and with adjusted df	6.924	2	25.723	.004
	Based on trimmed mean	10.350	2	63	<.001

ANOVA

delusion total score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	113500.394	2	56750.197	43.669	<.001
Within Groups	81872.227	63	1299.559		
Total	195372.621	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
delusion total score	Eta-squared	.581	.405	.679
	Epsilon-squared	.568	.386	.669
	Omega-squared Fixed-effect	.564	.383	.666
	Omega-squared Random-effect	.393	.237	.499

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

delusion total score

	Statistic[a]	df1	df2	Sig.
Welch	29.534	2	35.676	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: delusion total score

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	Delusion	MH	80.04545*	10.86930	<.001	53.9556	106.1353
		Gen	94.18182*	10.86930	<.001	68.0920	120.2717
	MH	Delusion	-80.04545*	10.86930	<.001	-106.1353	-53.9556
		Gen	14.13636	10.86930	.400	-11.9535	40.2262
	Gen	Delusion	-94.18182*	10.86930	<.001	-120.2717	-68.0920
		MH	-14.13636	10.86930	.400	-40.2262	11.9535
Games-Howell	Delusion	MH	80.04545*	13.01441	<.001	47.7892	112.3017
		Gen	94.18182*	12.45289	<.001	63.0164	125.3472
	MH	Delusion	-80.04545*	13.01441	<.001	-112.3017	-47.7892
		Gen	14.13636*	5.47504	.037	.7239	27.5488
	Gen	Delusion	-94.18182*	12.45289	<.001	-125.3472	-63.0164
		MH	-14.13636*	5.47504	.037	-27.5488	-.7239

*. The mean difference is significant at the 0.05 level.

delusion total score

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1	2
Tukey HSD[a]	Gen	22	16.6364	
	MH	22	30.7727	
	Delusion	22		110.8182
	Sig.		.400	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Delusion Total Score

Descriptives

delusion total yes responses

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Delusion	22	10.9545	3.83564	.81776	9.2539	12.6552	8.00	20.00
MH	22	3.5455	1.94513	.41470	2.6830	4.4079	.00	6.00
Gen	22	2.8636	2.00702	.42790	1.9738	3.7535	.00	6.00
Total	66	5.7879	4.57254	.56284	4.6638	6.9120	.00	20.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
delusion total yes responses	Based on Mean	7.564	2	63	.001
	Based on Median	2.423	2	63	.097
	Based on Median and with adjusted df	2.423	2	32.571	.105
	Based on trimmed mean	6.516	2	63	.003

ANOVA

delusion total yes responses

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	886.030	2	443.015	59.006	<.001
Within Groups	473.000	63	7.508		
Total	1359.030	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
delusion total yes responses	Eta-squared	.652	.496	.735
	Epsilon-squared	.641	.480	.726
	Omega-squared Fixed-effect	.637	.476	.723
	Omega-squared Random-effect	.468	.312	.567

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

delusion total yes responses

	Statistic[a]	df1	df2	Sig.
Welch	39.534	2	39.890	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: delusion total yes responses

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	Delusion	MH	7.40909*	.82616	<.001	5.4260	9.3921
		Gen	8.09091*	.82616	<.001	6.1079	10.0740
	MH	Delusion	-7.40909*	.82616	<.001	-9.3921	-5.4260
		Gen	.68182	.82616	.689	-1.3012	2.6649
	Gen	Delusion	-8.09091*	.82616	<.001	-10.0740	-6.1079
		MH	-.68182	.82616	.689	-2.6649	1.3012
Games-Howell	Delusion	MH	7.40909*	.91690	<.001	5.1529	9.6653
		Gen	8.09091*	.92295	<.001	5.8218	10.3600
	MH	Delusion	-7.40909*	.91690	<.001	-9.6653	-5.1529
		Gen	.68182	.59588	.493	-.7659	2.1296
	Gen	Delusion	-8.09091*	.92295	<.001	-10.3600	-5.8218
		MH	-.68182	.59588	.493	-2.1296	.7659

*. The mean difference is significant at the 0.05 level.

delusion total yes responses

	Group Number (1,2,3)	N	Subset for alpha = 0.05: 1	2
Tukey HSD[a]	Gen	22	2.8636	
	MH	22	3.5455	
	Delusion	22		10.9545
	Sig.		.689	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

PANSS Delusion Total Score

Descriptives

Delusions

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean: Lower Bound	95% Confidence Interval for Mean: Upper Bound	Minimum	Maximum
Delusion	22	3.6818	.94548	.20158	3.2626	4.1010	3.00	6.00
MH	22	1.2727	.45584	.09719	1.0706	1.4748	1.00	2.00
Gen	22	1.1364	.35125	.07489	.9806	1.2921	1.00	2.00
Total	66	2.0303	1.33555	.16439	1.7020	2.3586	1.00	6.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Delusions	Based on Mean	17.717	2	63	<.001
	Based on Median	4.341	2	63	.017
	Based on Median and with adjusted df	4.341	2	36.755	.020
	Based on trimmed mean	15.503	2	63	<.001

ANOVA

Delusions

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	90.212	2	45.106	110.454	<.001
Within Groups	25.727	63	.408		
Total	115.939	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	Upper
Delusions	Eta-squared	.778	.669	.832
	Epsilon-squared	.771	.659	.826
	Omega-squared Fixed-effect	.768	.655	.824
	Omega-squared Random-effect	.624	.487	.701

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Delusions

	Statistic[a]	df1	df2	Sig.
Welch	69.880	2	38.426	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Delusions

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	2.40909*	.19268	<.001	1.9466	2.8716
		Gen	2.54545*	.19268	<.001	2.0830	3.0079
	MH	Delusion	-2.40909*	.19268	<.001	-2.8716	-1.9466
		Gen	.13636	.19268	.760	-.3261	.5989
	Gen	Delusion	-2.54545*	.19268	<.001	-3.0079	-2.0830
		MH	-.13636	.19268	.760	-.5989	.3261
Games-Howell	Delusion	MH	2.40909*	.22378	<.001	1.8577	2.9605
		Gen	2.54545*	.21504	<.001	2.0119	3.0790
	MH	Delusion	-2.40909*	.22378	<.001	-2.9605	-1.8577
		Gen	.13636	.12269	.513	-.1624	.4351
	Gen	Delusion	-2.54545*	.21504	<.001	-3.0790	-2.0119
		MH	-.13636	.12269	.513	-.4351	.1624

*. The mean difference is significant at the 0.05 level.

Delusions

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1	2
Tukey HSD[a]	Gen	22	1.1364	
	MH	22	1.2727	
	Delusion	22		3.6818
	Sig.		.760	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Grandiosity

Descriptives

Grandiosity

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	Upper Bound	Minimum	Maximum
Delusion	22	2.5909	1.50108	.32003	1.9254	3.2565	1.00	5.00
MH	22	1.1818	.39477	.08417	1.0068	1.3568	1.00	2.00
Gen	22	1.0455	.21320	.04545	.9509	1.1400	1.00	2.00
Total	66	1.6061	1.13516	.13973	1.3270	1.8851	1.00	5.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Grandiosity	Based on Mean	53.653	2	63	<.001
	Based on Median	50.131	2	63	<.001
	Based on Median and with adjusted df	50.131	2	39.211	<.001
	Based on trimmed mean	54.380	2	63	<.001

ANOVA

Grandiosity

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	32.212	2	16.106	19.685	<.001
Within Groups	51.545	63	.818		
Total	83.758	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	Upper
Grandiosity	Eta-squared	.385	.188	.519
	Epsilon-squared	.365	.162	.503
	Omega-squared Fixed-effect	.362	.160	.500
	Omega-squared Random-effect	.221	.087	.333

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Grandiosity

	Statistic[a]	df1	df2	Sig.
Welch	11.814	2	34.340	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Grandiosity

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	1.40909*	.27273	<.001	.7545	2.0637
		Gen	1.54545*	.27273	<.001	.8908	2.2001
	MH	Delusion	-1.40909*	.27273	<.001	-2.0637	-.7545
		Gen	.13636	.27273	.872	-.5183	.7910
	Gen	Delusion	-1.54545*	.27273	<.001	-2.2001	-.8908
		MH	-.13636	.27273	.872	-.7910	.5183
Games-Howell	Delusion	MH	1.40909*	.33091	<.001	.5825	2.2357
		Gen	1.54545*	.32324	<.001	.7330	2.3579
	MH	Delusion	-1.40909*	.33091	<.001	-2.2357	-.5825
		Gen	.13636	.09566	.340	-.0986	.3713
	Gen	Delusion	-1.54545*	.32324	<.001	-2.3579	-.7330
		MH	-.13636	.09566	.340	-.3713	.0986

*. The mean difference is significant at the 0.05 level.

Grandiosity

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1	2
Tukey HSD[a]	Gen	22	1.0455	
	MH	22	1.1818	
	Delusion	22		2.5909
	Sig.		.872	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Suspiciousness

Descriptives

Suspiciousness

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	3.3636	1.25529	.26763	2.8071	3.9202	1.00	5.00
MH	22	1.5000	.51177	.10911	1.2731	1.7269	1.00	2.00
Gen	22	1.3182	.47673	.10164	1.1068	1.5296	1.00	2.00
Total	66	2.0606	1.23884	.15249	1.7561	2.3652	1.00	5.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Suspiciousness	Based on Mean	11.328	2	63	<.001
	Based on Median	10.617	2	63	<.001
	Based on Median and with adjusted df	10.617	2	35.870	<.001
	Based on trimmed mean	11.336	2	63	<.001

ANOVA

Suspiciousness

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	56.394	2	28.197	40.965	<.001
Within Groups	43.364	63	.688		
Total	99.758	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Suspiciousness	Eta-squared	.565	.386	.667
	Epsilon-squared	.552	.367	.656
	Omega-squared Fixed-effect	.548	.363	.653
	Omega-squared Random-effect	.377	.222	.485

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Suspiciousness

	Statistic[a]	df1	df2	Sig.
Welch	25.231	2	38.938	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Suspiciousness

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	1.86364*	.25015	<.001	1.2632	2.4641
		Gen	2.04545*	.25015	<.001	1.4450	2.6459
	MH	Delusion	-1.86364*	.25015	<.001	-2.4641	-1.2632
		Gen	.18182	.25015	.749	-.4186	.7823
	Gen	Delusion	-2.04545*	.25015	<.001	-2.6459	-1.4450
		MH	-.18182	.25015	.749	-.7823	.4186
Games-Howell	Delusion	MH	1.86364*	.28902	<.001	1.1482	2.5791
		Gen	2.04545*	.28628	<.001	1.3355	2.7554
	MH	Delusion	-1.86364*	.28902	<.001	-2.5791	-1.1482
		Gen	.18182	.14912	.449	-.1805	.5442
	Gen	Delusion	-2.04545*	.28628	<.001	-2.7554	-1.3355
		MH	-.18182	.14912	.449	-.5442	.1805

*. The mean difference is significant at the 0.05 level.

Suspiciousness

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Gen	22	1.3182	
	MH	22	1.5000	
	Delusion	22		3.3636
	Sig.		.749	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Social Network

Social Network Diversity

Descriptives

social network size

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	25.7273	19.06176	4.06398	17.2758	34.1788	7.00	76.00
MH	22	16.0000	10.71270	2.28395	11.2503	20.7497	3.00	44.00
Gen	22	14.5909	11.45450	2.44211	9.5123	19.6696	3.00	48.00
Total	66	18.7727	14.89119	1.83298	15.1120	22.4334	3.00	76.00

ANOVA

Social network diversity

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	37.121	2	18.561	4.184	.020
Within Groups	279.500	63	4.437		
Total	316.621	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Social network diversity	Eta-squared	.117	.002	.257
	Epsilon-squared	.089	-.030	.233
	Omega-squared Fixed-effect	.088	-.029	.230
	Omega-squared Random-effect	.046	-.014	.130

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Social network diversity

	Statistic[a]	df1	df2	Sig.
Welch	5.924	2	40.027	.006

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Social network diversity

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	.68182	.63507	.534	-.8426	2.2062
		Gen	1.81818*	.63507	.015	.2938	3.3426
	MH	Delusion	-.68182	.63507	.534	-2.2062	.8426
		Gen	1.13636	.63507	.181	-.3880	2.6607
	Gen	Delusion	-1.81818*	.63507	.015	-3.3426	-.2938
		MH	-1.13636	.63507	.181	-2.6607	.3880
Games-Howell	Delusion	MH	.68182	.70815	.604	-1.0428	2.4065
		Gen	1.81818*	.53783	.005	.5077	3.1287
	MH	Delusion	-.68182	.70815	.604	-2.4065	1.0428
		Gen	1.13636	.64748	.200	-.4515	2.7242
	Gen	Delusion	-1.81818*	.53783	.005	-3.1287	-.5077
		MH	-1.13636	.64748	.200	-2.7242	.4515

*. The mean difference is significant at the 0.05 level.

Social network diversity

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Gen	22	5.0909	
	MH	22	6.2273	6.2273
	Delusion	22		6.9091
	Sig.		.181	.534

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Social Network Size

Descriptives

Number of embedded networks

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	2.5909	1.76363	.37601	1.8090	3.3729	.00	6.00
MH	22	2.2273	1.47783	.31507	1.5720	2.8825	.00	5.00
Gen	22	2.1818	1.36753	.29156	1.5755	2.7881	.00	6.00
Total	66	2.3333	1.53255	.18864	1.9566	2.7101	.00	6.00

ANOVA

social network size

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1617.909	2	808.955	3.983	.024
Within Groups	12795.682	63	203.106		
Total	14413.591	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
social network size	Eta-squared	.112	.001	.251
	Epsilon-squared	.084	-.031	.227
	Omega-squared Fixed-effect	.083	-.031	.224
	Omega-squared Random-effect	.043	-.015	.126

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

social network size

	Statistic[a]	df1	df2	Sig.
Welch	2.836	2	40.327	.070

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: social network size

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	9.72727	4.29700	.069	-.5869	20.0415
		Gen	11.13636*	4.29700	.031	.8222	21.4506
	MH	Delusion	-9.72727	4.29700	.069	-20.0415	.5869
		Gen	1.40909	4.29700	.943	-8.9051	11.7233
	Gen	Delusion	-11.13636*	4.29700	.031	-21.4506	-.8222
		MH	-1.40909	4.29700	.943	-11.7233	8.9051
Games-Howell	Delusion	MH	9.72727	4.66180	.108	-1.7108	21.1654
		Gen	11.13636	4.74129	.062	-.4755	22.7482
	MH	Delusion	-9.72727	4.66180	.108	-21.1654	1.7108
		Gen	1.40909	3.34370	.907	-6.7157	9.5339
	Gen	Delusion	-11.13636	4.74129	.062	-22.7482	.4755
		MH	-1.40909	3.34370	.907	-9.5339	6.7157

*. The mean difference is significant at the 0.05 level.

Embedded Network

Descriptives

Number of embedded networks

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	2.5909	1.76363	.37601	1.8090	3.3729	.00	6.00
MH	22	2.2273	1.47783	.31507	1.5720	2.8825	.00	5.00
Gen	22	2.1818	1.36753	.29156	1.5755	2.7881	.00	6.00
Total	66	2.3333	1.53255	.18864	1.9566	2.7101	.00	6.00

ANOVA

Number of embedded networks

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.212	2	1.106	.463	.631
Within Groups	150.455	63	2.388		
Total	152.667	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
Number of embedded networks	Eta-squared	.014	.000	.092
	Epsilon-squared	-.017	-.032	.064
	Omega-squared Fixed-effect	-.017	-.031	.063
	Omega-squared Random-effect	-.008	-.015	.032

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Number of embedded networks

	Statistic[a]	df1	df2	Sig.
Welch	.402	2	41.579	.672

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Number of embedded networks

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	.36364	.46595	.716	-.7548	1.4821
		Gen	.40909	.46595	.656	-.7093	1.5275
	MH	Delusion	-.36364	.46595	.716	-1.4821	.7548
		Gen	.04545	.46595	.995	-1.0730	1.1639
	Gen	Delusion	-.40909	.46595	.656	-1.5275	.7093
		MH	-.04545	.46595	.995	-1.1639	1.0730
Games-Howell	Delusion	MH	.36364	.49056	.741	-.8295	1.5568
		Gen	.40909	.47580	.668	-.7495	1.5677
	MH	Delusion	-.36364	.49056	.741	-1.5568	.8295
		Gen	.04545	.42928	.994	-.9977	1.0886
	Gen	Delusion	-.40909	.47580	.668	-1.5677	.7495
		MH	-.04545	.42928	.994	-1.0886	.9977

Reality Sharing

MANOVA: Belief Plausibility

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptive Statistics

	Group Number (1,2,3)	Mean	Std. Deviation	N
Neutral Belief total score	Delusion	30.2273	4.36361	22
	MH	33.6818	1.52398	22
	Gen	33.8182	1.86793	22
	Total	32.5758	3.29130	66
Paranoid Belief total score	Delusion	17.0000	8.28079	22
	MH	12.5909	7.68833	22
	Gen	7.5455	3.20308	22
	Total	12.3788	7.72760	66
Conspiracy Belief total score	Delusion	18.6364	5.65303	22
	MH	15.2727	3.75667	22
	Gen	15.0909	3.22060	22
	Total	16.3333	4.57530	66

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.994	3529.499[b]	3.000	61.000	<.001	.994
	Wilks' Lambda	.006	3529.499[b]	3.000	61.000	<.001	.994
	Hotelling's Trace	173.582	3529.499[b]	3.000	61.000	<.001	.994
	Roy's Largest Root	173.582	3529.499[b]	3.000	61.000	<.001	.994
Group_Number	Pillai's Trace	.449	5.986	6.000	124.000	<.001	.225
	Wilks' Lambda	.577	6.439[b]	6.000	122.000	<.001	.241
	Hotelling's Trace	.689	6.886	6.000	120.000	<.001	.256
	Roy's Largest Root	.615	12.720[c]	3.000	62.000	<.001	.381

a. Design: Intercept + Group_Number

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
Neutral Belief total score	Based on Mean	11.835	2	63	<.001
	Based on Median	7.451	2	63	.001
	Based on Median and with adjusted df	7.451	2	40.607	.002
	Based on trimmed mean	10.801	2	63	<.001
Paranoid Belief total score	Based on Mean	8.473	2	63	<.001
	Based on Median	4.839	2	63	.011
	Based on Median and with adjusted df	4.839	2	50.056	.012
	Based on trimmed mean	8.224	2	63	<.001
Conspiracy Belief total score	Based on Mean	5.878	2	63	.005
	Based on Median	5.613	2	63	.006
	Based on Median and with adjusted df	5.613	2	59.864	.006
	Based on trimmed mean	5.971	2	63	.004

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

a. Design: Intercept + Group_Number

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Neutral Belief total score	182.212[a]	2	91.106	10.997	<.001	.259
	Paranoid Belief total score	984.758[b]	2	492.379	10.708	<.001	.254
	Conspiracy Belief total score	175.394[c]	2	87.697	4.661	.013	.129
Intercept	Neutral Belief total score	70037.879	1	70037.879	8454.320	<.001	.993
	Paranoid Belief total score	10113.470	1	10113.470	219.951	<.001	.777
	Conspiracy Belief total score	17607.333	1	17607.333	935.871	<.001	.937
Group_Number	Neutral Belief total score	182.212	2	91.106	10.997	<.001	.259
	Paranoid Belief total score	984.758	2	492.379	10.708	<.001	.254
	Conspiracy Belief total score	175.394	2	87.697	4.661	.013	.129
Error	Neutral Belief total score	521.909	63	8.284			
	Paranoid Belief total score	2896.773	63	45.981			
	Conspiracy Belief total score	1185.273	63	18.814			
Total	Neutral Belief total score	70742.000	66				
	Paranoid Belief total score	13995.000	66				
	Conspiracy Belief total score	18968.000	66				
Corrected Total	Neutral Belief total score	704.121	65				
	Paranoid Belief total score	3881.530	65				
	Conspiracy Belief total score	1360.667	65				

a. R Squared = .259 (Adjusted R Squared = .235)

b. R Squared = .254 (Adjusted R Squared = .230)

c. R Squared = .129 (Adjusted R Squared = .101)

Group Number (1,2,3)

Dependent Variable	Group Number (1,2,3)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Neutral Belief total score	Delusion	30.227	.614	29.001	31.454
	MH	33.682	.614	32.456	34.908
	Gen	33.818	.614	32.592	35.044
Paranoid Belief total score	Delusion	17.000	1.446	14.111	19.889
	MH	12.591	1.446	9.702	15.480
	Gen	7.545	1.446	4.656	10.434
Conspiracy Belief total score	Delusion	18.636	.925	16.788	20.484
	MH	15.273	.925	13.425	17.121
	Gen	15.091	.925	13.243	16.939

Post Hoc Tests

Multiple Comparisons

Dependent Variable		(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Neutral Belief total score	Tukey HSD	Delusion	MH	-3.4545*	.86782	<.001	-5.5376	-1.3715
			Gen	-3.5909*	.86782	<.001	-5.6740	-1.5079
		MH	Delusion	3.4545*	.86782	<.001	1.3715	5.5376
			Gen	-.1364	.86782	.986	-2.2194	1.9467
		Gen	Delusion	3.5909*	.86782	<.001	1.5079	5.6740
			MH	.1364	.86782	.986	-1.9467	2.2194
	Games-Howell	Delusion	MH	-3.4545*	.98543	.005	-5.9030	-1.0061
			Gen	-3.5909*	1.01198	.004	-6.0927	-1.0891
		MH	Delusion	3.4545*	.98543	.005	1.0061	5.9030
			Gen	-.1364	.51397	.962	-1.3869	1.1142
		Gen	Delusion	3.5909*	1.01198	.004	1.0891	6.0927
			MH	.1364	.51397	.962	-1.1142	1.3869
Paranoid Belief total score	Tukey HSD	Delusion	MH	4.4091	2.04452	.087	-.4984	9.3166
			Gen	9.4545*	2.04452	<.001	4.5470	14.3621
		MH	Delusion	-4.4091	2.04452	.087	-9.3166	.4984
			Gen	5.0455*	2.04452	.043	.1379	9.9530
		Gen	Delusion	-9.4545*	2.04452	<.001	-14.3621	-4.5470
			MH	-5.0455*	2.04452	.043	-9.9530	-.1379
	Games-Howell	Delusion	MH	4.4091	2.40909	.172	-1.4449	10.2631
			Gen	9.4545*	1.89294	<.001	4.7626	14.1465
		MH	Delusion	-4.4091	2.40909	.172	-10.2631	1.4449
			Gen	5.0455*	1.77572	.022	.6524	9.4385
		Gen	Delusion	-9.4545*	1.89294	<.001	-14.1465	-4.7626
			MH	-5.0455*	1.77572	.022	-9.4385	-.6524
Conspiracy Belief total score	Tukey HSD	Delusion	MH	3.3636*	1.30780	.033	.2245	6.5028
			Gen	3.5455*	1.30780	.023	.4063	6.6846
		MH	Delusion	-3.3636*	1.30780	.033	-6.5028	-.2245
			Gen	.1818	1.30780	.989	-2.9573	3.3210
		Gen	Delusion	-3.5455*	1.30780	.023	-6.6846	-.4063
			MH	-.1818	1.30780	.989	-3.3210	2.9573
	Games-Howell	Delusion	MH	3.3636	1.44709	.065	-.1713	6.8986
			Gen	3.5455*	1.38710	.040	.1434	6.9475
		MH	Delusion	-3.3636	1.44709	.065	-6.8986	.1713
			Gen	.1818	1.05496	.984	-2.3834	2.7470
		Gen	Delusion	-3.5455*	1.38710	.040	-6.9475	-.1434
			MH	-.1818	1.05496	.984	-2.7470	2.3834

Based on observed means.
The error term is Mean Square(Error) = 18.814.

*. The mean difference is significant at the .05 level.

Neutral Belief total score

	Group Number (1,2,3)	N	Subset 1	Subset 2
Tukey HSD[a,b]	Delusion	22	30.2273	
	MH	22		33.6818
	Gen	22		33.8182
	Sig.		1.000	.986

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 8.284.

a. Uses Harmonic Mean Sample Size = 22.000.

b. Alpha = .05.

Paranoid Belief total score

	Group Number (1,2,3)	N	Subset 1	Subset 2
Tukey HSD[a,b]	Gen	22	7.5455	
	MH	22		12.5909
	Delusion	22		17.0000
	Sig.		1.000	.087

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 45.981.

a. Uses Harmonic Mean Sample Size = 22.000.

b. Alpha = .05.

Conspiracy Belief total score

	Group Number (1,2,3)	N	Subset 1	Subset 2
Tukey HSD[a,b]	Gen	22	15.0909	
	MH	22	15.2727	
	Delusion	22		18.6364
	Sig.		.989	1.000

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 18.814.

a. Uses Harmonic Mean Sample Size = 22.000.

b. Alpha = .05.

ANOVAs: Paranoid Belief

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

Paranoid Belief total score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Delusion	22	17.0000	8.28079	1.76547	13.3285	20.6715	5.00	32.00
MH	22	12.5909	7.68833	1.63916	9.1821	15.9997	5.00	31.00
Gen	22	7.5455	3.20308	.68290	6.1253	8.9656	5.00	15.00
Total	66	12.3788	7.72760	.95120	10.4791	14.2785	5.00	32.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Paranoid Belief total score	Based on Mean	8.473	2	63	<.001
	Based on Median	4.839	2	63	.011
	Based on Median and with adjusted df	4.839	2	50.056	.012
	Based on trimmed mean	8.224	2	63	<.001

ANOVA

Paranoid Belief total score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	984.758	2	492.379	10.708	<.001
Within Groups	2896.773	63	45.981		
Total	3881.530	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Paranoid Belief total score	Eta-squared	.254	.076	.401
	Epsilon-squared	.230	.047	.382
	Omega-squared Fixed-effect	.227	.046	.378
	Omega-squared Random-effect	.128	.024	.233

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Paranoid Belief total score

	Statistic[a]	df1	df2	Sig.
Welch	14.549	2	34.975	<.001

a. Asymptotically F distributed.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Paranoid Belief total score

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	Delusion	MH	4.40909	2.04452	.087	-.4984	9.3166
		Gen	9.45455*	2.04452	<.001	4.5470	14.3621
	MH	Delusion	-4.40909	2.04452	.087	-9.3166	.4984
		Gen	5.04545*	2.04452	.043	.1379	9.9530
	Gen	Delusion	-9.45455*	2.04452	<.001	-14.3621	-4.5470
		MH	-5.04545*	2.04452	.043	-9.9530	-.1379
Games-Howell	Delusion	MH	4.40909	2.40909	.172	-1.4449	10.2631
		Gen	9.45455*	1.89294	<.001	4.7626	14.1465
	MH	Delusion	-4.40909	2.40909	.172	-10.2631	1.4449
		Gen	5.04545*	1.77572	.022	.6524	9.4385
	Gen	Delusion	-9.45455*	1.89294	<.001	-14.1465	-4.7626
		MH	-5.04545*	1.77572	.022	-9.4385	-.6524

*. The mean difference is significant at the 0.05 level.

Paranoid Belief total score

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1	Subset for alpha = 0.05 2
Tukey HSD[a]	Gen	22	7.5455	
	MH	22		12.5909
	Delusion	22		17.0000
	Sig.		1.000	.087

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

MANOVA: Share Beliefs

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptive Statistics

	Group Number (1,2,3)	Mean	Std. Deviation	N
Neutral Share score	Delusion	30.0455	5.21424	22
	MH	33.9545	1.29016	22
	Gen	34.5000	.91287	22
	Total	32.8333	3.68608	66
Paranoid Share total score	Delusion	23.0000	8.54679	22
	MH	26.7727	8.63510	22
	Gen	30.7273	6.97056	22
	Total	26.8333	8.57292	66
Conspiracy Share belief total socre	Delusion	27.7273	4.85192	22
	MH	28.0909	6.44323	22
	Gen	30.2273	4.85928	22
	Total	28.6818	5.46643	66

Multivariate Tests[a]

Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.992	2477.559[b]	3.000	61.000	<.001	.992
	Wilks' Lambda	.008	2477.559[b]	3.000	61.000	<.001	.992
	Hotelling's Trace	121.847	2477.559[b]	3.000	61.000	<.001	.992
	Roy's Largest Root	121.847	2477.559[b]	3.000	61.000	<.001	.992
Group_Number	Pillai's Trace	.420	5.492	6.000	124.000	<.001	.210
	Wilks' Lambda	.594	6.052[b]	6.000	122.000	<.001	.229
	Hotelling's Trace	.661	6.607	6.000	120.000	<.001	.248
	Roy's Largest Root	.623	12.885[c]	3.000	62.000	<.001	.384

a. Design: Intercept + Group_Number

b. Exact statistic

c. The statistic is an upper bound on F that yields a lower bound on the significance level.

Levene's Test of Equality of Error Variances[a]

		Levene Statistic	df1	df2	Sig.
Neutral Share score	Based on Mean	20.503	2	63	<.001
	Based on Median	20.542	2	63	<.001
	Based on Median and with adjusted df	20.542	2	28.149	<.001
	Based on trimmed mean	21.554	2	63	<.001
Paranoid Share total score	Based on Mean	.930	2	63	.400
	Based on Median	.844	2	63	.435
	Based on Median and with adjusted df	.844	2	61.853	.435
	Based on trimmed mean	1.089	2	63	.343
Conspiracy Share belief total socre	Based on Mean	1.466	2	63	.239
	Based on Median	1.032	2	63	.362
	Based on Median and with adjusted df	1.032	2	58.297	.363
	Based on trimmed mean	1.294	2	63	.281

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

a. Design: Intercept + Group_Number

Tests of Between-Subjects Effects

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	Neutral Share score	259.758[a]	2	129.879	13.125	<.001	.294
	Paranoid Share total score	656.939[b]	2	328.470	5.022	.009	.138
	Conspiracy Share belief total socre	80.273[c]	2	40.136	1.358	.265	.041
Intercept	Neutral Share score	71149.833	1	71149.833	7190.206	<.001	.991
	Paranoid Share total score	47521.833	1	47521.833	726.629	<.001	.920
	Conspiracy Share belief total socre	54294.682	1	54294.682	1836.993	<.001	.967
Group_Number	Neutral Share score	259.758	2	129.879	13.125	<.001	.294
	Paranoid Share total score	656.939	2	328.470	5.022	.009	.138
	Conspiracy Share belief total socre	80.273	2	40.136	1.358	.265	.041
Error	Neutral Share score	623.409	63	9.895			
	Paranoid Share total score	4120.227	63	65.400			
	Conspiracy Share belief total socre	1862.045	63	29.556			
Total	Neutral Share score	72033.000	66				
	Paranoid Share total score	52299.000	66				
	Conspiracy Share belief total socre	56237.000	66				
Corrected Total	Neutral Share score	883.167	65				
	Paranoid Share total score	4777.167	65				
	Conspiracy Share belief total socre	1942.318	65				

a. R Squared = .294 (Adjusted R Squared = .272)

b. R Squared = .138 (Adjusted R Squared = .110)

c. R Squared = .041 (Adjusted R Squared = .011)

Group Number (1,2,3)

Dependent Variable	Group Number (1,2,3)	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Neutral Share score	Delusion	30.045	.671	28.705	31.386
	MH	33.955	.671	32.614	35.295
	Gen	34.500	.671	33.160	35.840
Paranoid Share total score	Delusion	23.000	1.724	19.555	26.445
	MH	26.773	1.724	23.327	30.218
	Gen	30.727	1.724	27.282	34.173
Conspiracy Share belief total socre	Delusion	27.727	1.159	25.411	30.044
	MH	28.091	1.159	25.775	30.407
	Gen	30.227	1.159	27.911	32.544

Post Hoc Tests

Multiple Comparisons

Dependent Variable		(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Neutral Share score	Tukey HSD	Delusion	MH	-3.9091*	.94846	<.001	-6.1857	-1.6325
			Gen	-4.4545*	.94846	<.001	-6.7312	-2.1779
		MH	Delusion	3.9091*	.94846	<.001	1.6325	6.1857
			Gen	-.5455	.94846	.834	-2.8221	1.7312
		Gen	Delusion	4.4545*	.94846	<.001	2.1779	6.7312
			MH	.5455	.94846	.834	-1.7312	2.8221
	Games-Howell	Delusion	MH	-3.9091*	1.14520	.006	-6.7724	-1.0457
			Gen	-4.4545*	1.12859	.002	-7.2871	-1.6220
		MH	Delusion	3.9091*	1.14520	.006	1.0457	6.7724
			Gen	-.5455	.33695	.250	-1.3674	.2765
		Gen	Delusion	4.4545*	1.12859	.002	1.6220	7.2871
			MH	.5455	.33695	.250	-.2765	1.3674
Paranoid Share total score	Tukey HSD	Delusion	MH	-3.7727	2.43834	.276	-9.6255	2.0801
			Gen	-7.7273*	2.43834	.007	-13.5801	-1.8745
		MH	Delusion	3.7727	2.43834	.276	-2.0801	9.6255
			Gen	-3.9545	2.43834	.244	-9.8074	1.8983
		Gen	Delusion	7.7273*	2.43834	.007	1.8745	13.5801
			MH	3.9545	2.43834	.244	-1.8983	9.8074
	Games-Howell	Delusion	MH	-3.7727	2.59030	.322	-10.0659	2.5204
			Gen	-7.7273*	2.35137	.006	-13.4483	-2.0062
		MH	Delusion	3.7727	2.59030	.322	-2.5204	10.0659
			Gen	-3.9545	2.36599	.229	-9.7120	1.8029
		Gen	Delusion	7.7273*	2.35137	.006	2.0062	13.4483
			MH	3.9545	2.36599	.229	-1.8029	9.7120
Conspiracy Share belief total socre	Tukey HSD	Delusion	MH	-.3636	1.63919	.973	-4.2982	3.5709
			Gen	-2.5000	1.63919	.286	-6.4346	1.4346
		MH	Delusion	.3636	1.63919	.973	-3.5709	4.2982
			Gen	-2.1364	1.63919	.399	-6.0709	1.7982
		Gen	Delusion	2.5000	1.63919	.286	-1.4346	6.4346
			MH	2.1364	1.63919	.399	-1.7982	6.0709
	Games-Howell	Delusion	MH	-.3636	1.71962	.976	-4.5531	3.8258
			Gen	-2.5000	1.46402	.214	-6.0568	1.0568
		MH	Delusion	.3636	1.71962	.976	-3.8258	4.5531
			Gen	-2.1364	1.72057	.436	-6.3280	2.0553
		Gen	Delusion	2.5000	1.46402	.214	-1.0568	6.0568
			MH	2.1364	1.72057	.436	-2.0553	6.3280

Based on observed means.
The error term is Mean Square(Error) = 29.556.

*. The mean difference is significant at the .05 level.

Neutral Share score

	Group Number (1,2,3)	N	Subset 1	Subset 2
Tukey HSD[a,b]	Delusion	22	30.0455	
	MH	22		33.9545
	Gen	22		34.5000
	Sig.		1.000	.834

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 9.895.

a. Uses Harmonic Mean Sample Size = 22.000.

b. Alpha = .05.

Paranoid Share total score

	Group Number (1,2,3)	N	Subset 1	Subset 2
Tukey HSD[a,b]	Delusion	22	23.0000	
	MH	22	26.7727	26.7727
	Gen	22		30.7273
	Sig.		.276	.244

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 65.400.

a. Uses Harmonic Mean Sample Size = 22.000.

b. Alpha = .05.

Conspiracy Share belief total socre

	Group Number (1,2,3)	N	Subset 1
Tukey HSD[a,b]	Delusion	22	27.7273
	MH	22	28.0909
	Gen	22	30.2273
	Sig.		.286

Means for groups in homogeneous subsets are displayed.
Based on observed means.
The error term is Mean Square(Error) = 29.556.

a. Uses Harmonic Mean Sample Size = 22.000.

b. Alpha = .05.

Neutral Share Score

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

Neutral Share score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Delusion	22	30.0455	5.21424	1.11168	27.7336	32.3573	15.00	35.00
MH	22	33.9545	1.29016	.27506	33.3825	34.5266	31.00	35.00
Gen	22	34.5000	.91287	.19462	34.0953	34.9047	32.00	35.00
Total	66	32.8333	3.68608	.45372	31.9272	33.7395	15.00	35.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Neutral Share score	Based on Mean	20.503	2	63	<.001
	Based on Median	20.542	2	63	<.001
	Based on Median and with adjusted df	20.542	2	28.149	<.001
	Based on trimmed mean	21.554	2	63	<.001

ANOVA

Neutral Share score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	259.758	2	129.879	13.125	<.001
Within Groups	623.409	63	9.895		
Total	883.167	65			

ANOVA Effect Sizes[a]

			95% Confidence Interval	
		Point Estimate	Lower	Upper
Neutral Share score	Eta-squared	.294	.107	.439
	Epsilon-squared	.272	.079	.421
	Omega-squared Fixed-effect	.269	.078	.417
	Omega-squared Random-effect	.155	.040	.263

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Neutral Share score

	Statistic[a]	df1	df2	Sig.
Welch	8.395	2	36.512	.001

a. Asymptotically F distributed.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Neutral Share score

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-3.90909*	.94846	<.001	-6.1857	-1.6325
		Gen	-4.45455*	.94846	<.001	-6.7312	-2.1779
	MH	Delusion	3.90909*	.94846	<.001	1.6325	6.1857
		Gen	-.54545	.94846	.834	-2.8221	1.7312
	Gen	Delusion	4.45455*	.94846	<.001	2.1779	6.7312
		MH	.54545	.94846	.834	-1.7312	2.8221
Games-Howell	Delusion	MH	-3.90909*	1.14520	.006	-6.7724	-1.0457
		Gen	-4.45455*	1.12859	.002	-7.2871	-1.6220
	MH	Delusion	3.90909*	1.14520	.006	1.0457	6.7724
		Gen	-.54545	.33695	.250	-1.3674	.2765
	Gen	Delusion	4.45455*	1.12859	.002	1.6220	7.2871
		MH	.54545	.33695	.250	-.2765	1.3674

*. The mean difference is significant at the 0.05 level.

Neutral Share score

			Subset for alpha = 0.05	
	Group Number (1,2,3)	N	1	2
Tukey HSD[a]	Delusion	22	30.0455	
	MH	22		33.9545
	Gen	22		34.5000
	Sig.		1.000	.834

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Paranoid Share Score

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

Paranoid Share total score

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	23.0000	8.54679	1.82218	19.2106	26.7894	6.00	35.00
MH	22	26.7727	8.63510	1.84101	22.9441	30.6013	6.00	35.00
Gen	22	30.7273	6.97056	1.48613	27.6367	33.8178	5.00	35.00
Total	66	26.8333	8.57292	1.05525	24.7258	28.9408	5.00	35.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Paranoid Share total score	Based on Mean	.930	2	63	.400
	Based on Median	.844	2	63	.435
	Based on Median and with adjusted df	.844	2	61.853	.435
	Based on trimmed mean	1.089	2	63	.343

ANOVA

Paranoid Share total score

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	656.939	2	328.470	5.022	.009
Within Groups	4120.227	63	65.400		
Total	4777.167	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Paranoid Share total score	Eta-squared	.138	.010	.280
	Epsilon-squared	.110	-.022	.258
	Omega-squared Fixed-effect	.109	-.022	.255
	Omega-squared Random-effect	.057	-.011	.146

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Paranoid Share total score

	Statistic[a]	df1	df2	Sig.
Welch	5.393	2	41.548	.008

a. Asymptotically F distributed.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Paranoid Share total score

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	Delusion	MH	-3.77273	2.43834	.276	-9.6255	2.0801
		Gen	-7.72727*	2.43834	.007	-13.5801	-1.8745
	MH	Delusion	3.77273	2.43834	.276	-2.0801	9.6255
		Gen	-3.95455	2.43834	.244	-9.8074	1.8983
	Gen	Delusion	7.72727*	2.43834	.007	1.8745	13.5801
		MH	3.95455	2.43834	.244	-1.8983	9.8074
Games-Howell	Delusion	MH	-3.77273	2.59030	.322	-10.0659	2.5204
		Gen	-7.72727*	2.35137	.006	-13.4483	-2.0062
	MH	Delusion	3.77273	2.59030	.322	-2.5204	10.0659
		Gen	-3.95455	2.36599	.229	-9.7120	1.8029
	Gen	Delusion	7.72727*	2.35137	.006	2.0062	13.4483
		MH	3.95455	2.36599	.229	-1.8029	9.7120

*. The mean difference is significant at the 0.05 level.

Paranoid Share total score

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1	Subset for alpha = 0.05 2
Tukey HSD[a]	Delusion	22	23.0000	
	MH	22	26.7727	26.7727
	Gen	22		30.7273
	Sig.		.276	.244

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Conspiracy Share Score

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

Conspiracy Share belief total socre

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean Lower Bound	95% Confidence Interval for Mean Upper Bound	Minimum	Maximum
Delusion	22	27.7273	4.85192	1.03443	25.5761	29.8785	16.00	35.00
MH	22	28.0909	6.44323	1.37370	25.2341	30.9477	13.00	35.00
Gen	22	30.2273	4.85928	1.03600	28.0728	32.3818	22.00	35.00
Total	66	28.6818	5.46643	.67287	27.3380	30.0256	13.00	35.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Conspiracy Share belief total socre	Based on Mean	1.466	2	63	.239
	Based on Median	1.032	2	63	.362
	Based on Median and with adjusted df	1.032	2	58.297	.363
	Based on trimmed mean	1.294	2	63	.281

ANOVA

Conspiracy Share belief total socre

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	80.273	2	40.136	1.358	.265
Within Groups	1862.045	63	29.556		
Total	1942.318	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
Conspiracy Share belief total socre	Eta-squared	.041	.000	.150
	Epsilon-squared	.011	-.032	.123
	Omega-squared Fixed-effect	.011	-.031	.121
	Omega-squared Random-effect	.005	-.015	.065

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Conspiracy Share belief total socre

	Statistic[a]	df1	df2	Sig.
Welch	1.594	2	41.414	.215

a. Asymptotically F distributed.

Post Hoc Tests

Multiple Comparisons

Dependent Variable: Conspiracy Share belief total socre

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-.36364	1.63919	.973	-4.2982	3.5709
		Gen	-2.50000	1.63919	.286	-6.4346	1.4346
	MH	Delusion	.36364	1.63919	.973	-3.5709	4.2982
		Gen	-2.13636	1.63919	.399	-6.0709	1.7982
	Gen	Delusion	2.50000	1.63919	.286	-1.4346	6.4346
		MH	2.13636	1.63919	.399	-1.7982	6.0709
Games-Howell	Delusion	MH	-.36364	1.71962	.976	-4.5531	3.8258
		Gen	-2.50000	1.46402	.214	-6.0568	1.0568
	MH	Delusion	.36364	1.71962	.976	-3.8258	4.5531
		Gen	-2.13636	1.72057	.436	-6.3280	2.0553
	Gen	Delusion	2.50000	1.46402	.214	-1.0568	6.0568
		MH	2.13636	1.72057	.436	-2.0553	6.3280

Conspiracy Share belief total socre

	Group Number (1,2,3)	N	Subset for alpha = 0.05
			1
Tukey HSD[a]	Delusion	22	27.7273
	MH	22	28.0909
	Gen	22	30.2273
	Sig.		.286

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

ANOVA Neutral Belief Consensus

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

N_Consensus

				Bootstrap[a]			
						95% Confidence Interval	
			Statistic	Bias	Std. Error	Lower	Upper
Delusion	N		22	0	4	15	30
	Mean		.6364	.0129	.5522	-.4734	1.7597
	Std. Deviation		2.61034	-.12165	.57182	1.42313	3.64698
	Std. Error		.55653				
	95% Confidence Interval for Mean	Lower Bound	-.5210				
		Upper Bound	1.7937				
	Minimum		-7.00				
	Maximum		6.00				
MH	N		22	0	4	15	29
	Mean		.0000	-.0048	.3981	-.8499	.7500
	Std. Deviation		1.79947	-.11143	.48204	.79173	2.66340
	Std. Error		.38365				
	95% Confidence Interval for Mean	Lower Bound	-.7978				
		Upper Bound	.7978				
	Minimum		-6.00				
	Maximum		3.00				
Gen	N		22	0	4	15	30
	Mean		.0455	.0004	.2054	-.3529	.4664
	Std. Deviation		.99892	-.05246	.23423	.45255	1.35449
	Std. Error		.21297				
	95% Confidence Interval for Mean	Lower Bound	-.3974				
		Upper Bound	.4883				
	Minimum		-2.00				
	Maximum		3.00				
Total	N		66	0	0	66	66
	Mean		.2273	.0009	.2326	-.2576	.6818
	Std. Deviation		1.91187	-.03845	.30102	1.29058	2.45085
	Std. Error		.23533				
	95% Confidence Interval for Mean	Lower Bound	-.2427				
		Upper Bound	.6973				
	Minimum		-7.00				
	Maximum		6.00				

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

ANOVA

N_Consensus

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5.545	2	2.773	.753	.475
Within Groups	232.045	63	3.683		
Total	237.591	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
N_Consensus	Eta-squared	.023	.000	.115
	Epsilon-squared	-.008	-.032	.087
	Omega-squared Fixed-effect	-.008	-.031	.085
	Omega-squared Random-effect	-.004	-.015	.045

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

N_Consensus

	Statistic[a]	df1	df2	Sig.
Welch	.521	2	36.658	.598

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: N_Consensus

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	.63636	.57866	.518	-.7526	2.0253
		Gen	.59091	.57866	.566	-.7981	1.9799
	MH	Delusion	-.63636	.57866	.518	-2.0253	.7526
		Gen	-.04545	.57866	.997	-1.4344	1.3435
	Gen	Delusion	-.59091	.57866	.566	-1.9799	.7981
		MH	.04545	.57866	.997	-1.3435	1.4344
Games-Howell	Delusion	MH	.63636	.67595	.618	-1.0134	2.2862
		Gen	.59091	.59588	.588	-.8865	2.0683
	MH	Delusion	-.63636	.67595	.618	-2.2862	1.0134
		Gen	-.04545	.43880	.994	-1.1224	1.0315
	Gen	Delusion	-.59091	.59588	.588	-2.0683	.8865
		MH	.04545	.43880	.994	-1.0315	1.1224

Bootstrap for Multiple Comparisons

Dependent Variable: N_Consensus

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bootstrap[a] Bias	Std. Error	95% Confidence Interval Lower	Upper
Tukey HSD	Delusion	MH	.63636	.01765	.68972	-.69492	2.05216
		Gen	.59091	.01253	.58468	-.60248	1.75570
	MH	Delusion	-.63636	-.01765	.68972	-2.05216	.69492
		Gen	-.04545	-.00512	.44577	-.99741	.80343
	Gen	Delusion	-.59091	-.01253	.58468	-1.75570	.60248
		MH	.04545	.00512	.44577	-.80343	.99741
Games-Howell	Delusion	MH	.63636	.01765	.68972	-.69492	2.05216
		Gen	.59091	.01253	.58468	-.60248	1.75570
	MH	Delusion	-.63636	-.01765	.68972	-2.05216	.69492
		Gen	-.04545	-.00512	.44577	-.99741	.80343
	Gen	Delusion	-.59091	-.01253	.58468	-1.75570	.60248
		MH	.04545	.00512	.44577	-.80343	.99741

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

N_Consensus

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1
Tukey HSD[a]	MH	22	.0000
	Gen	22	.0455
	Delusion	22	.6364
	Sig.		.518

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

ANOVA Paranoid Consensus

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

Pa_Consensus

				Bootstrap[a]			
						95% Confidence Interval	
			Statistic	Bias	Std. Error	Lower	Upper
Delusion	N		22	0	4	15	30
	Mean		-5.9091	-.0131	2.9240	-11.8249	-.0835
	Std. Deviation		14.23245	-.44754	1.58953	10.63402	16.92052
	Std. Error		3.03437				
	95% Confidence Interval for Mean	Lower Bound	-12.2194				
		Upper Bound	.4012				
	Minimum		-30.00				
	Maximum		19.00				
MH	N		22	0	4	14	30
	Mean		-14.0000	-.1046	2.7161	-19.2371	-8.6672
	Std. Deviation		12.69796	-.46685	1.67470	8.42786	15.35721
	Std. Error		2.70721				
	95% Confidence Interval for Mean	Lower Bound	-19.6300				
		Upper Bound	-8.3700				
	Minimum		-30.00				
	Maximum		12.00				
Gen	N		22	0	4	15	30
	Mean		-21.0909	.0187	1.9510	-25.0000	-16.9521
	Std. Deviation		9.29367	-.29280	1.18332	6.53012	11.13843
	Std. Error		1.98142				
	95% Confidence Interval for Mean	Lower Bound	-25.2115				
		Upper Bound	-16.9703				
	Minimum		-30.00				
	Maximum		.00				
Total	N		66	0	0	66	66
	Mean		-13.6667	-.0177	1.6055	-16.7723	-10.3951
	Std. Deviation		13.58317	-.15874	.90567	11.67009	15.19315
	Std. Error		1.67197				
	95% Confidence Interval for Mean	Lower Bound	-17.0058				
		Upper Bound	-10.3275				
	Minimum		-30.00				
	Maximum		19.00				

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

ANOVA

Pa_Consensus

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2539.030	2	1269.515	8.460	<.001
Within Groups	9453.636	63	150.058		
Total	11992.667	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
Pa_Consensus	Eta-squared	.212	.048	.360
	Epsilon-squared	.187	.018	.339
	Omega-squared Fixed-effect	.184	.017	.336
	Omega-squared Random-effect	.102	.009	.202

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Pa_Consensus

	Statistic[a]	df1	df2	Sig.
Welch	8.951	2	40.535	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Pa_Consensus

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	8.09091	3.69346	.081	-.7746	16.9564
		Gen	15.18182*	3.69346	<.001	6.3163	24.0473
	MH	Delusion	-8.09091	3.69346	.081	-16.9564	.7746
		Gen	7.09091	3.69346	.141	-1.7746	15.9564
	Gen	Delusion	-15.18182*	3.69346	<.001	-24.0473	-6.3163
		MH	-7.09091	3.69346	.141	-15.9564	1.7746
Games-Howell	Delusion	MH	8.09091	4.06650	.127	-1.7933	17.9751
		Gen	15.18182*	3.62400	<.001	6.3253	24.0384
	MH	Delusion	-8.09091	4.06650	.127	-17.9751	1.7933
		Gen	7.09091	3.35485	.100	-1.0869	15.2687
	Gen	Delusion	-15.18182*	3.62400	<.001	-24.0384	-6.3253
		MH	-7.09091	3.35485	.100	-15.2687	1.0869

*. The mean difference is significant at the 0.05 level.

Bootstrap for Multiple Comparisons

Dependent Variable: Pa_Consensus

				Bootstrap[a]			
						95% Confidence Interval	
	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bias	Std. Error	Lower	Upper
Tukey HSD	Delusion	MH	8.09091	.09152	3.98288	.42539	15.74635
		Gen	15.18182	-.03183	3.59206	7.96112	22.10351
	MH	Delusion	-8.09091	-.09152	3.98288	-15.74635	-.42539
		Gen	7.09091	-.12335	3.37103	.84630	13.56041
	Gen	Delusion	-15.18182	.03183	3.59206	-22.10351	-7.96112
		MH	-7.09091	.12335	3.37103	-13.56041	-.84630
Games-Howell	Delusion	MH	8.09091	.09152	3.98288	.42539	15.74635
		Gen	15.18182	-.03183	3.59206	7.96112	22.10351
	MH	Delusion	-8.09091	-.09152	3.98288	-15.74635	-.42539
		Gen	7.09091	-.12335	3.37103	.84630	13.56041
	Gen	Delusion	-15.18182	.03183	3.59206	-22.10351	-7.96112
		MH	-7.09091	.12335	3.37103	-13.56041	-.84630

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

Pa_Consensus

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Gen	22	-21.0909	
	MH	22	-14.0000	-14.0000
	Delusion	22		-5.9091
	Sig.		.141	.081

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Conspiracy Consensus

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

C_Consensus

				Bootstrap[a]			
						95% Confidence Interval	
			Statistic	Bias	Std. Error	Lower	Upper
Delusion	N		22	0	4	15	29
	Mean		-6.0000	-.0430	1.6085	-9.3145	-2.7656
	Std. Deviation		7.27684	-.21928	.89161	5.19864	8.80756
	Std. Error		1.55143				
	95% Confidence Interval for Mean	Lower Bound	-9.2264				
		Upper Bound	-2.7736				
	Minimum		-18.00				
	Maximum		8.00				
MH	N		22	0	4	14	30
	Mean		-12.8182	-.1286	1.6004	-15.9472	-9.6012
	Std. Deviation		7.94407	-.20516	.90441	5.83666	9.36545
	Std. Error		1.69368				
	95% Confidence Interval for Mean	Lower Bound	-16.3404				
		Upper Bound	-9.2960				
	Minimum		-24.00				
	Maximum		2.00				
Gen	N		22	0	4	15	30
	Mean		-13.3636	-.0963	1.3809	-16.1037	-10.5911
	Std. Deviation		6.75803	-.31256	1.23931	3.91095	8.64507
	Std. Error		1.44082				
	95% Confidence Interval for Mean	Lower Bound	-16.3600				
		Upper Bound	-10.3673				
	Minimum		-24.00				
	Maximum		4.00				
Total	N		66	0	0	66	66
	Mean		-10.7273	-.0924	.9866	-12.6667	-8.9242
	Std. Deviation		7.97794	-.07545	.53576	6.84406	8.93578
	Std. Error		.98202				
	95% Confidence Interval for Mean	Lower Bound	-12.6885				
		Upper Bound	-8.7660				
	Minimum		-24.00				
	Maximum		8.00				

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

ANOVA

C_Consensus

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	740.727	2	370.364	6.870	.002
Within Groups	3396.364	63	53.911		
Total	4137.091	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
C_Consensus	Eta-squared	.179	.029	.326
	Epsilon-squared	.153	-.002	.305
	Omega-squared Fixed-effect	.151	-.002	.301
	Omega-squared Random-effect	.082	-.001	.177

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

C_Consensus

	Statistic[a]	df1	df2	Sig.
Welch	6.967	2	41.821	.002

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: C_Consensus

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	6.81818*	2.21381	.009	1.5043	12.1320
		Gen	7.36364*	2.21381	.004	2.0498	12.6775
	MH	Delusion	-6.81818*	2.21381	.009	-12.1320	-1.5043
		Gen	.54545	2.21381	.967	-4.7684	5.8593
	Gen	Delusion	-7.36364*	2.21381	.004	-12.6775	-2.0498
		MH	-.54545	2.21381	.967	-5.8593	4.7684
Games-Howell	Delusion	MH	6.81818*	2.29684	.013	1.2365	12.3999
		Gen	7.36364*	2.11728	.003	2.2187	12.5086
	MH	Delusion	-6.81818*	2.29684	.013	-12.3999	-1.2365
		Gen	.54545	2.22363	.967	-4.8619	5.9528
	Gen	Delusion	-7.36364*	2.11728	.003	-12.5086	-2.2187
		MH	-.54545	2.22363	.967	-5.9528	4.8619

*. The mean difference is significant at the 0.05 level.

Bootstrap for Multiple Comparisons

Dependent Variable: C_Consensus

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bootstrap[a] Bias	Std. Error	95% Confidence Interval Lower	Upper
Tukey HSD	Delusion	MH	6.81818	.08565	2.27579	2.38525	11.68921
		Gen	7.36364	.05333	2.08550	3.24760	11.63861
	MH	Delusion	-6.81818	-.08565	2.27579	-11.68921	-2.38525
		Gen	.54545	-.03232	2.09450	-3.58333	4.48186
	Gen	Delusion	-7.36364	-.05333	2.08550	-11.63861	-3.24760
		MH	-.54545	.03232	2.09450	-4.48186	3.58333
Games-Howell	Delusion	MH	6.81818	.08565	2.27579	2.38525	11.68921
		Gen	7.36364	.05333	2.08550	3.24760	11.63861
	MH	Delusion	-6.81818	-.08565	2.27579	-11.68921	-2.38525
		Gen	.54545	-.03232	2.09450	-3.58333	4.48186
	Gen	Delusion	-7.36364	-.05333	2.08550	-11.63861	-3.24760
		MH	-.54545	.03232	2.09450	-4.48186	3.58333

a. Unless otherwise noted, bootstrap results are based on 1000 bootstrap samples

C_Consensus

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1	2
Tukey HSD[a]	Gen	22	-13.3636	
	MH	22	-12.8182	
	Delusion	22		-6.0000
	Sig.		.967	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Cooperation

Chi-Square: Total

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Type * YesNo	66	100.0%	0	0.0%	66	100.0%

Type * YesNo Crosstabulation

Count

		YesNo		
		No	Yes	Total
Type	Delusion	17a	5a	22
	Gen	9a	13b	22
	MH	14a	8a	22
Total		40	26	66

Each subscript letter denotes a subset of YesNo categories whose column proportions do not differ significantly from each other at the .05 level.

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.219[a]	2	.045
Likelihood Ratio	6.312	2	.043
McNemar-Bowker Test	.	.	.[b]
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 8.67.

b. Computed only for a PxP table, where P must be greater than 1.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.307	.045
	Cramer's V	.307	.045
N of Valid Cases		66	

Chi-Square: Neutral

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group_Number * Neutral_A	66	100.0%	0	0.0%	66	100.0%

Group_Number * Neutral_A Crosstabulation

			Neutral_A		
			No	Yes	Total
Group_Number	1	Count	8	14	22
		Expected Count	5.3	16.7	22.0
	2	Count	6	16	22
		Expected Count	5.3	16.7	22.0
	3	Count	2	20	22
		Expected Count	5.3	16.7	22.0
Total		Count	16	50	66
		Expected Count	16.0	50.0	66.0

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	4.620[a]	2	.099
Likelihood Ratio	5.082	2	.079
Linear-by-Linear Association	4.387	1	.036
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.33.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.265	.099
	Cramer's V	.265	.099
N of Valid Cases		66	

Chi-Square: Political

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group_Number * Political_A	66	100.0%	0	0.0%	66	100.0%

Group_Number * Political_A Crosstabulation

			Political_A		
			No	Yes	Total
Group_Number	1	Count	7	15	22
		Expected Count	5.7	16.3	22.0
		% within Group_Number	31.8%	68.2%	100.0%
		Adjusted Residual	.8	-.8	
	2	Count	5	17	22
		Expected Count	5.7	16.3	22.0
		% within Group_Number	22.7%	77.3%	100.0%
		Adjusted Residual	-.4	.4	
	3	Count	5	17	22
		Expected Count	5.7	16.3	22.0
		% within Group_Number	22.7%	77.3%	100.0%
		Adjusted Residual	-.4	.4	
Total		Count	17	49	66
		Expected Count	17.0	49.0	66.0
		% within Group_Number	25.8%	74.2%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.634[a]	2	.728
Likelihood Ratio	.621	2	.733
Linear-by-Linear Association	.468	1	.494
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 5.67.

Chi-Square: Conspiracy

Group_Number * Conspiracy_A Crosstabulation

			Conspiracy_A		
			No	Yes	Total
Group_Number	1	Count	6	16	22
		Expected Count	4.0	18.0	22.0
		% within Group_Number	27.3%	72.7%	100.0%
		Adjusted Residual	1.4	-1.4	
	2	Count	2	20	22
		Expected Count	4.0	18.0	22.0
		% within Group_Number	9.1%	90.9%	100.0%
		Adjusted Residual	-1.4	1.4	
	3	Count	4	18	22
		Expected Count	4.0	18.0	22.0
		% within Group_Number	18.2%	81.8%	100.0%
		Adjusted Residual	.0	.0	
Total		Count	12	54	66
		Expected Count	12.0	54.0	66.0
		% within Group_Number	18.2%	81.8%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	2.444[a]	2	.295
Likelihood Ratio	2.538	2	.281
Linear-by-Linear Association	.602	1	.438
N of Valid Cases	66		

a. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 4.00.

Chi-Square: Paranoid

Case Processing Summary

	Cases					
	Valid		Missing		Total	
	N	Percent	N	Percent	N	Percent
Group_Number * Paranoid_A	66	100.0%	0	0.0%	66	100.0%

Group_Number * Paranoid_A Crosstabulation

			Paranoid_A		
			No	Yes	Total
Group_Number	1	Count	7	15	22
		Expected Count	6.0	16.0	22.0
		% within Group_Number	31.8%	68.2%	100.0%
		Adjusted Residual	.6	-.6	
	2	Count	4	18	22
		Expected Count	6.0	16.0	22.0
		% within Group_Number	18.2%	81.8%	100.0%
		Adjusted Residual	-1.2	1.2	
	3	Count	7	15	22
		Expected Count	6.0	16.0	22.0
		% within Group_Number	31.8%	68.2%	100.0%
		Adjusted Residual	.6	-.6	
Total		Count	18	48	66
		Expected Count	18.0	48.0	66.0
		% within Group_Number	27.3%	72.7%	100.0%

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.375[a]	2	.503
Likelihood Ratio	1.440	2	.487
Linear-by-Linear Association	.000	1	1.000
N of Valid Cases	66		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 6.00.

Symmetric Measures

		Value	Approximate Significance
Nominal by Nominal	Phi	.144	.503
	Cramer's V	.144	.503
N of Valid Cases		66	

Neutral Threat

Bootstrap Specifications

Sampling Method	Simple
Number of Samples	5000
Confidence Interval Level	95.0%
Confidence Interval Type	Percentile

Descriptives

Threat in sharing neutral beliefs with close circle

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	2.2727	1.77769	.37900	1.4845	3.0609	1.00	6.00
MH	22	1.8182	1.36753	.29156	1.2119	2.4245	1.00	5.00
Gen	22	1.4545	1.40500	.29955	.8316	2.0775	1.00	7.00
Total	66	1.8485	1.54165	.18976	1.4695	2.2275	1.00	7.00

Tests of Homogeneity of Variances

		Levene Statistic	df1	df2	Sig.
Threat in sharing neutral beliefs with close circle	Based on Mean	3.885	2	63	.026
	Based on Median	1.583	2	63	.213
	Based on Median and with adjusted df	1.583	2	59.276	.214
	Based on trimmed mean	4.360	2	63	.017

ANOVA

Threat in sharing neutral beliefs with close circle

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.394	2	3.697	1.583	.213
Within Groups	147.091	63	2.335		
Total	154.485	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Threat in sharing neutral beliefs with close circle	Eta-squared	.048	.000	.161
	Epsilon-squared	.018	-.032	.134
	Omega-squared Fixed-effect	.017	-.031	.133
	Omega-squared Random-effect	.009	-.015	.071

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Threat in sharing neutral beliefs with close circle

	Statistic[a]	df1	df2	Sig.
Welch	1.420	2	41.524	.253

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Threat in sharing neutral beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	Delusion	MH	.45455	.46071	.588	-.6513	1.5604
		Gen	.81818	.46071	.186	-.2877	1.9240
	MH	Delusion	-.45455	.46071	.588	-1.5604	.6513
		Gen	.36364	.46071	.711	-.7422	1.4695
	Gen	Delusion	-.81818	.46071	.186	-1.9240	.2877
		MH	-.36364	.46071	.711	-1.4695	.7422
Games-Howell	Delusion	MH	.45455	.47817	.612	-.7100	1.6191
		Gen	.81818	.48309	.220	-.3578	1.9941
	MH	Delusion	-.45455	.47817	.612	-1.6191	.7100
		Gen	.36364	.41801	.662	-.6519	1.3792
	Gen	Delusion	-.81818	.48309	.220	-1.9941	.3578
		MH	-.36364	.41801	.662	-1.3792	.6519

Bootstrap for Multiple Comparisons

Dependent Variable: Threat in sharing neutral beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bootstrap[a] Bias	Bootstrap[a] Std. Error	Bootstrap[a] 95% Confidence Interval Lower	Bootstrap[a] 95% Confidence Interval Upper
Tukey HSD	Delusion	MH	.45455	.00331	.47394	-.45178	1.41814
		Gen	.81818	-.00473	.48027	-.15154	1.74812
	MH	Delusion	-.45455	-.00331	.47394	-1.41814	.45178
		Gen	.36364	-.00804	.41944	-.48912	1.16141
	Gen	Delusion	-.81818	.00473	.48027	-1.74812	.15154
		MH	-.36364	.00804	.41944	-1.16141	.48912
Games-Howell	Delusion	MH	.45455	.00331	.47394	-.45178	1.41814
		Gen	.81818	-.00473	.48027	-.15154	1.74812
	MH	Delusion	-.45455	-.00331	.47394	-1.41814	.45178
		Gen	.36364	-.00804	.41944	-.48912	1.16141
	Gen	Delusion	-.81818	.00473	.48027	-1.74812	.15154
		MH	-.36364	.00804	.41944	-1.16141	.48912

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Threat in sharing neutral beliefs with close circle

	Group Number (1,2,3)	N	Subset for alpha = 0.05 1
Tukey HSD[a]	Gen	22	1.4545
	MH	22	1.8182
	Delusion	22	2.2727
	Sig.		.186

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Paranoid Threat

Descriptives

Threat in sharing Parnoid beliefs with close circle

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	3.3636	1.86562	.39775	2.5365	4.1908	1.00	6.00
MH	22	2.8636	1.80727	.38531	2.0623	3.6649	1.00	7.00
Gen	22	1.6364	1.21677	.25942	1.0969	2.1758	1.00	5.00
Total	66	2.6212	1.78683	.21994	2.1820	3.0605	1.00	7.00

ANOVA

Threat in sharing Parnoid beliefs with close circle

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	34.758	2	17.379	6.337	.003
Within Groups	172.773	63	2.742		
Total	207.530	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Threat in sharing Parnoid beliefs with close circle	Eta-squared	.167	.023	.314
	Epsilon-squared	.141	-.008	.292
	Omega-squared Fixed-effect	.139	-.008	.289
	Omega-squared Random-effect	.075	-.004	.169

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Threat in sharing Parnoid beliefs with close circle

	Statistic[a]	df1	df2	Sig.
Welch	7.781	2	40.206	.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Threat in sharing Parnoid beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	.50000	.49931	.579	-.6985	1.6985
		Gen	1.72727*	.49931	.003	.5288	2.9258
	MH	Delusion	-.50000	.49931	.579	-1.6985	.6985
		Gen	1.22727*	.49931	.044	.0288	2.4258
	Gen	Delusion	-1.72727*	.49931	.003	-2.9258	-.5288
		MH	-1.22727*	.49931	.044	-2.4258	-.0288
Games-Howell	Delusion	MH	.50000	.55378	.642	-.8455	1.8455
		Gen	1.72727*	.47487	.002	.5667	2.8878
	MH	Delusion	-.50000	.55378	.642	-1.8455	.8455
		Gen	1.22727*	.46450	.032	.0929	2.3616
	Gen	Delusion	-1.72727*	.47487	.002	-2.8878	-.5667
		MH	-1.22727*	.46450	.032	-2.3616	-.0929

*. The mean difference is significant at the 0.05 level.

Bootstrap for Multiple Comparisons

Dependent Variable: Threat in sharing Parnoid beliefs with close circle

				Bootstrap[a]			
						95% Confidence Interval	
	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bias	Std. Error	Lower	Upper
Tukey HSD	Delusion	MH	.50000	.00773	.55742	-.61107	1.56965
		Gen	1.72727	.00930	.47039	.80520	2.64705
	MH	Delusion	-.50000	-.00773	.55742	-1.56965	.61107
		Gen	1.22727	.00157	.45987	.33958	2.12318
	Gen	Delusion	-1.72727	-.00930	.47039	-2.64705	-.80520
		MH	-1.22727	-.00157	.45987	-2.12318	-.33958
Games-Howell	Delusion	MH	.50000	.00773	.55742	-.61107	1.56965
		Gen	1.72727	.00930	.47039	.80520	2.64705
	MH	Delusion	-.50000	-.00773	.55742	-1.56965	.61107
		Gen	1.22727	.00157	.45987	.33958	2.12318
	Gen	Delusion	-1.72727	-.00930	.47039	-2.64705	-.80520
		MH	-1.22727	-.00157	.45987	-2.12318	-.33958

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Threat in sharing Parnoid beliefs with close circle

			Subset for alpha = 0.05	
	Group Number (1,2,3)	N	1	2
Tukey HSD[a]	Gen	22	1.6364	
	MH	22		2.8636
	Delusion	22		3.3636
	Sig.		1.000	.579

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Conspiracy Threat

Descriptives

Threat in sharing conspiracy beliefs with close circle

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Delusion	22	2.6364	1.70561	.36364	1.8801	3.3926	1.00	6.00
MH	22	3.0455	1.93900	.41340	2.1857	3.9052	1.00	7.00
Gen	22	1.7727	1.23179	.26262	1.2266	2.3189	1.00	5.00
Total	66	2.4848	1.71188	.21072	2.0640	2.9057	1.00	7.00

ANOVA

Threat in sharing conspiracy beliefs with close circle

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	18.576	2	9.288	3.404	.039
Within Groups	171.909	63	2.729		
Total	190.485	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	Upper
Threat in sharing conspiracy beliefs with close circle	Eta-squared	.098	.000	.232
	Epsilon-squared	.069	-.032	.208
	Omega-squared Fixed-effect	.068	-.031	.205
	Omega-squared Random-effect	.035	-.015	.114

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Threat in sharing conspiracy beliefs with close circle

	Statistic[a]	df1	df2	Sig.
Welch	3.993	2	40.370	.026

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Threat in sharing conspiracy beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-.40909	.49806	.691	-1.6046	.7864
		Gen	.86364	.49806	.201	-.3319	2.0591
	MH	Delusion	.40909	.49806	.691	-.7864	1.6046
		Gen	1.27273*	.49806	.034	.0772	2.4682
	Gen	Delusion	-.86364	.49806	.201	-2.0591	.3319
		MH	-1.27273*	.49806	.034	-2.4682	-.0772
Games-Howell	Delusion	MH	-.40909	.55057	.739	-1.7475	.9293
		Gen	.86364	.44855	.145	-.2301	1.9573
	MH	Delusion	.40909	.55057	.739	-.9293	1.7475
		Gen	1.27273*	.48976	.035	.0750	2.4705
	Gen	Delusion	-.86364	.44855	.145	-1.9573	.2301
		MH	-1.27273*	.48976	.035	-2.4705	-.0750

*. The mean difference is significant at the 0.05 level.

Bootstrap for Multiple Comparisons

Dependent Variable: Threat in sharing conspiracy beliefs with close circle

				Bootstrap[a]			
						95% Confidence Interval	
	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bias	Std. Error	Lower	Upper
Tukey HSD	Delusion	MH	-.40909	-.00716	.53978	-1.47545	.65940
		Gen	.86364	-.00286	.43870	.01924	1.70571
	MH	Delusion	.40909	.00716	.53978	-.65940	1.47545
		Gen	1.27273	.00430	.48819	.29342	2.23808
	Gen	Delusion	-.86364	.00286	.43870	-1.70571	-.01924
		MH	-1.27273	-.00430	.48819	-2.23808	-.29342
Games-Howell	Delusion	MH	-.40909	-.00716	.53978	-1.47545	.65940
		Gen	.86364	-.00286	.43870	.01924	1.70571
	MH	Delusion	.40909	.00716	.53978	-.65940	1.47545
		Gen	1.27273	.00430	.48819	.29342	2.23808
	Gen	Delusion	-.86364	.00286	.43870	-1.70571	-.01924
		MH	-1.27273	-.00430	.48819	-2.23808	-.29342

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Threat in sharing conspiracy beliefs with close circle

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Gen	22	1.7727	
	Delusion	22	2.6364	2.6364
	MH	22		3.0455
	Sig.		.201	.691

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Neutral Trust

Descriptives

Trust in sharing neutral beliefs with close circle

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	5.1818	1.53177	.32657	4.5027	5.8610	2.00	7.00
MH	22	6.0455	1.13294	.24154	5.5431	6.5478	4.00	7.00
Gen	22	6.7273	.70250	.14977	6.4158	7.0387	4.00	7.00
Total	66	5.9848	1.31842	.16229	5.6607	6.3090	2.00	7.00

ANOVA

Trust in sharing neutral beliefs with close circle

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	26.394	2	13.197	9.602	<.001
Within Groups	86.591	63	1.374		
Total	112.985	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval	
			Lower	Upper
Trust in sharing neutral beliefs with close circle	Eta-squared	.234	.062	.381
	Epsilon-squared	.209	.032	.362
	Omega-squared Fixed-effect	.207	.032	.358
	Omega-squared Random-effect	.115	.016	.218

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Trust in sharing neutral beliefs with close circle

	Statistic[a]	df1	df2	Sig.
Welch	10.184	2	38.129	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Trust in sharing neutral beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-.86364*	.35348	.045	-1.7121	-.0152
		Gen	-1.54545*	.35348	<.001	-2.3939	-.6970
	MH	Delusion	.86364*	.35348	.045	.0152	1.7121
		Gen	-.68182	.35348	.139	-1.5303	.1667
	Gen	Delusion	1.54545*	.35348	<.001	.6970	2.3939
		MH	.68182	.35348	.139	-.1667	1.5303
Games-Howell	Delusion	MH	-.86364	.40619	.098	-1.8536	.1263
		Gen	-1.54545*	.35928	<.001	-2.4320	-.6589
	MH	Delusion	.86364	.40619	.098	-.1263	1.8536
		Gen	-.68182	.28421	.056	-1.3773	.0137
	Gen	Delusion	1.54545*	.35928	<.001	.6589	2.4320
		MH	.68182	.28421	.056	-.0137	1.3773

*. The mean difference is significant at the 0.05 level.

Bootstrap for Multiple Comparisons

Dependent Variable: Trust in sharing neutral beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bootstrap[a]			
				Bias	Std. Error	95% Confidence Interval	
						Lower	Upper
Tukey HSD	Delusion	MH	-.86364	.00376	.40207	-1.63910	-.07145
		Gen	-1.54545	.00916	.35705	-2.23057	-.83174
	MH	Delusion	.86364	-.00376	.40207	.07145	1.63910
		Gen	-.68182	.00539	.28050	-1.22217	-.12621
	Gen	Delusion	1.54545	-.00916	.35705	.83174	2.23057
		MH	.68182	-.00539	.28050	.12621	1.22217
Games-Howell	Delusion	MH	-.86364	.00376	.40207	-1.63910	-.07145
		Gen	-1.54545	.00916	.35705	-2.23057	-.83174
	MH	Delusion	.86364	-.00376	.40207	.07145	1.63910
		Gen	-.68182	.00539	.28050	-1.22217	-.12621
	Gen	Delusion	1.54545	-.00916	.35705	.83174	2.23057
		MH	.68182	-.00539	.28050	.12621	1.22217

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Trust in sharing neutral beliefs with close circle

	Group Number (1,2,3)	N	Subset for alpha = 0.05	
			1	2
Tukey HSD[a]	Delusion	22	5.1818	
	MH	22		6.0455
	Gen	22		6.7273
	Sig.		1.000	.139

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Paranoid Trust

Descriptives

Trust in sharing paranoid beliefs with close circle

	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
Delusion	22	4.4545	1.94513	.41470	3.5921	5.3170	1.00	7.00
MH	22	4.8182	1.86793	.39824	3.9900	5.6464	1.00	7.00
Gen	22	6.3182	1.04135	.22202	5.8565	6.7799	4.00	7.00
Total	66	5.1970	1.83320	.22565	4.7463	5.6476	1.00	7.00

ANOVA

Trust in sharing paranoid beliefs with close circle

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	42.939	2	21.470	7.707	.001
Within Groups	175.500	63	2.786		
Total	218.439	65			

ANOVA Effect Sizes[a]

		Point Estimate	95% Confidence Interval Lower	Upper
Trust in sharing paranoid beliefs with close circle	Eta-squared	.197	.039	.344
	Epsilon-squared	.171	.008	.323
	Omega-squared Fixed-effect	.169	.008	.320
	Omega-squared Random-effect	.092	.004	.191

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

Robust Tests of Equality of Means

Trust in sharing paranoid beliefs with close circle

	Statistic[a]	df1	df2	Sig.
Welch	10.651	2	38.305	<.001

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Trust in sharing paranoid beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	Upper Bound
Tukey HSD	Delusion	MH	-.36364	.50324	.751	-1.5716	.8443
		Gen	-1.86364*	.50324	.001	-3.0716	-.6557
	MH	Delusion	.36364	.50324	.751	-.8443	1.5716
		Gen	-1.50000*	.50324	.011	-2.7079	-.2921
	Gen	Delusion	1.86364*	.50324	.001	.6557	3.0716
		MH	1.50000*	.50324	.011	.2921	2.7079
Games-Howell	Delusion	MH	-.36364	.57496	.803	-1.7606	1.0333
		Gen	-1.86364*	.47039	.001	-3.0194	-.7079
	MH	Delusion	.36364	.57496	.803	-1.0333	1.7606
		Gen	-1.50000*	.45595	.007	-2.6190	-.3810
	Gen	Delusion	1.86364*	.47039	.001	.7079	3.0194
		MH	1.50000*	.45595	.007	.3810	2.6190

*. The mean difference is significant at the 0.05 level.

Bootstrap for Multiple Comparisons

Dependent Variable: Trust in sharing paranoid beliefs with close circle

				Bootstrap[a]			
						95% Confidence Interval	
	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bias	Std. Error	Lower	Upper
Tukey HSD	Delusion	MH	-.36364	-.00421	.57435	-1.50000	.75599
		Gen	-1.86364	-.00369	.46843	-2.80946	-.95799
	MH	Delusion	.36364	.00421	.57435	-.75599	1.50000
		Gen	-1.50000	.00052	.45375	-2.41661	-.60410
	Gen	Delusion	1.86364	.00369	.46843	.95799	2.80946
		MH	1.50000	-.00052	.45375	.60410	2.41661
Games-Howell	Delusion	MH	-.36364	-.00421	.57435	-1.50000	.75599
		Gen	-1.86364	-.00369	.46843	-2.80946	-.95799
	MH	Delusion	.36364	.00421	.57435	-.75599	1.50000
		Gen	-1.50000	.00052	.45375	-2.41661	-.60410
	Gen	Delusion	1.86364	.00369	.46843	.95799	2.80946
		MH	1.50000	-.00052	.45375	.60410	2.41661

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Trust in sharing paranoid beliefs with close circle

			Subset for alpha = 0.05	
	Group Number (1,2,3)	N	1	2
Tukey HSD[a]	Delusion	22	4.4545	
	MH	22	4.8182	
	Gen	22		6.3182
	Sig.		.751	1.000

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Conspiracy Trust

Descriptives

Trust in sharing conspiracy beliefs with close circle

					95% Confidence Interval for Mean			
	N	Mean	Std. Deviation	Std. Error	Lower Bound	Upper Bound	Minimum	Maximum
Delusion	22	5.0000	1.57359	.33549	4.3023	5.6977	1.00	7.00
MH	22	5.0455	1.49530	.31880	4.3825	5.7084	2.00	7.00
Gen	22	5.7273	1.48586	.31679	5.0685	6.3861	3.00	7.00
Total	66	5.2576	1.53232	.18862	4.8809	5.6343	1.00	7.00

ANOVA

Trust in sharing conspiracy beliefs with close circle

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	7.303	2	3.652	1.583	.213
Within Groups	145.318	63	2.307		
Total	152.621	65			

ANOVA Effect Sizes[a,b]

		Point Estimate	95% Confidence Interval Lower	95% Confidence Interval Upper
Trust in sharing conspiracy beliefs with close circle	Eta-squared	.048	.000	.161
	Epsilon-squared	.018	-.032	.134
	Omega-squared Fixed-effect	.017	-.031	.133
	Omega-squared Random-effect	.009	-.015	.071

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Robust Tests of Equality of Means

Trust in sharing conspiracy beliefs with close circle

	Statistic[a]	df1	df2	Sig.
Welch	1.588	2	41.973	.216

a. Asymptotically F distributed.

Multiple Comparisons

Dependent Variable: Trust in sharing conspiracy beliefs with close circle

	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval Lower Bound	95% Confidence Interval Upper Bound
Tukey HSD	Delusion	MH	-.04545	.45792	.995	-1.1446	1.0537
		Gen	-.72727	.45792	.258	-1.8264	.3719
	MH	Delusion	.04545	.45792	.995	-1.0537	1.1446
		Gen	-.68182	.45792	.303	-1.7810	.4173
	Gen	Delusion	.72727	.45792	.258	-.3719	1.8264
		MH	.68182	.45792	.303	-.4173	1.7810
Games-Howell	Delusion	MH	-.04545	.46280	.995	-1.1699	1.0790
		Gen	-.72727	.46142	.267	-1.8484	.3939
	MH	Delusion	.04545	.46280	.995	-1.0790	1.1699
		Gen	-.68182	.44943	.293	-1.7737	.4101
	Gen	Delusion	.72727	.46142	.267	-.3939	1.8484
		MH	.68182	.44943	.293	-.4101	1.7737

Bootstrap for Multiple Comparisons

Dependent Variable: Trust in sharing conspiracy beliefs with close circle

				Bootstrap[a]			
						95% Confidence Interval	
	(I) Group Number (1,2,3)	(J) Group Number (1,2,3)	Mean Difference (I-J)	Bias	Std. Error	Lower	Upper
Tukey HSD	Delusion	MH	-.04545	-.00469	.46725	-.98957	.86998
		Gen	-.72727	-.00143	.46249	-1.63418	.17378
	MH	Delusion	.04545	.00469	.46725	-.86998	.98957
		Gen	-.68182	.00327	.44711	-1.54967	.19607
	Gen	Delusion	.72727	.00143	.46249	-.17378	1.63418
		MH	.68182	-.00327	.44711	-.19607	1.54967
Games-Howell	Delusion	MH	-.04545	-.00469	.46725	-.98957	.86998
		Gen	-.72727	-.00143	.46249	-1.63418	.17378
	MH	Delusion	.04545	.00469	.46725	-.86998	.98957
		Gen	-.68182	.00327	.44711	-1.54967	.19607
	Gen	Delusion	.72727	.00143	.46249	-.17378	1.63418
		MH	.68182	-.00327	.44711	-.19607	1.54967

a. Unless otherwise noted, bootstrap results are based on 5000 bootstrap samples

Trust in sharing conspiracy beliefs with close circle

			Subset for alpha = 0.05
	Group Number (1,2,3)	N	1
Tukey HSD[a]	Delusion	22	5.0000
	MH	22	5.0455
	Gen	22	5.7273
	Sig.		.258

Means for groups in homogeneous subsets are displayed.

a. Uses Harmonic Mean Sample Size = 22.000.

Appendix S

Assumption Testing and Results

Assumption Testing Conducted

One-way ANOVAs. Before analyses were conducted, the assumption of independent data was met. Box plots were examined to assess for outliers. Histograms and Q-Q plots were visually inspected for normality alongside a Shapiro-Wilk test (Shapiro & Wilk, 1965). Homogeneity of variance was assessed using Levene's test of equal variances (Levene, 1960). Any outliers were included in the data as it was felt they would provide important information about group differences. Where normality was violated, ANOVAs were conducted with 5000 Bootstrapping, as ANOVA is fairly robust to non-normality (Maxwell & Delaney, 2004) there was an equal number of participants in each group (Lix et al., 1996), and bootstrapping is recommended for violations to normality (Knief & Fortsmeier, 2021). Where homogeneity of variance was violated, Welch's F (Delacre et al., 2019) was reported and Games-Howell post-hoc

MANOVAs. Before analyses were conducted researchers ensured that there were two or more continuous dependent variables, that the independent variable was categorical with two or more groups and that the assumption of independent data was met.

Outliers were assessed by generating box plots. Normality was assessed by conducting a Shapiro-Wilk test. Multicollinearity was assessed by generating correlations between the dependent variables (Schroeder et al., 1990). Linearity was assessed by generating scatter matrix plots. Multivariate outliers were assessed by generating Mahalanobis distance (Ghorbani, 2019). Homogeneity of variance-covariance was assessed

by looking at Box's test (Desai et al., 2013). Homogeneity of variances was assessed using Levene's Test of Homogeneity of Variance.

Where outliers were present they were included, as it was thought they would give important information about group differences. Where normality was violated, MANOVAs were conducted with 5000 Bootstrapping, as MANOVA is fairly robust to non-normality (Gupta et al., 2008) there was an equal number of participants in each group (Lix et al., 1996), and bootstrapping is recommended for violations of normality (Konietschke et al., 2015). Where multicollinearity was violated, dependent variables were removed. Where linearity was violated dependent variables were transformed. Where multivariate outliers were present they were kept as MANOVA is fairly robust to multivariate outliers. Finally, where homogeneity of variance was violated, variables were transformed. If variable transformations were unsuccessful, MANOVAs were still conducted but loss of statistical power was reported and post-hoc testing used Welch's F and Games-Howell tests.

Chi-Square Test. Before analyses were conducted, data was randomly selected, and the variables were determined to be categorical.

Assumption Results.

Social Network

A series of ANOVAs were conducted.

Outliers. The assumption for outliers was violated for network size, diversity, and embedded networks. However, outliers were still included in the analyses as it was thought they would provide useful information about expected group differences.

Normality. As assessed by Shapiro-Wilk's test the normality was violated for all three variables ($p<.05$; network size, diversity, and embedded networks). As there were equal groups, and ANOVAs are robust to non-normality, they were conducted with 5000 bootstrapping.

Homogeneity. As assessed using Levene's test of equal variances there were no violations to homogeneity ($P>.05$)

Reality Sharing

Belief Plausibility and Belief Sharing. Two MANOVAs assessed belief plausibility, and willingness to share beliefs.

Outliers. Outliers were present for both MANOVAs. However, they were included, as it was thought they would give important information about group differences.

Normality. Normality was violated in all dependent variables. MANOVAs were still conducted as they are robust to non-normality, and there were equal groups. However, they were run with 5000 bootstrapping.

Multicollinearity. No violations of multicollinearity.

Linearity. No violations to linearity.

Homogeneity of Variance. The homogeneity of variance-covariances matrices was violated in both MANOVAs ($p < .05$). Furthermore, homogeneity of variance was violated in both MANOVAs ($p < .05$). Problematic variables were transformed, however were unsuccessful as data loss was 25-50%. It was therefore decided that MANOVAs would still be conducted with 5000 bootstrapping however, results would be reported that there was less confidence in the results due to lower statistical significance as a result of the violation.

Following significant results, univariate analyses were conducted to generate Welch's F test and Games Howell post hoc tests.

Belief Consensus. A series of ANOVAs were conducted to assess belief consensus between groups.

Outliers. The assumption for outliers was violated in neutral consensus and conspiracy consensus. However, outliers were still included in the analyses as it was thought they would provide useful information about expected group differences.

Normality. As assessed by Shapiro-Wilk's test the normality was violated in all groups in neutral consensus, and in the general population group in both paranoid and conspiracy consensus. ($p<.05$). As there were equal groups, and ANOVAs are robust to non-normality, they were conducted with 5000 bootstrapping.

Homogeneity of Variance. No violations to homogeneity.

Judgements of Similarity

Chi-square was used to assess judgements of similarity to self. There were no violations.

Threat and Trust

ANOVAs were used to assess threat and trust levels when sharing beliefs with others.

Outliers. The assumption for outliers was violated for neutral trust, paranoid trust, neutral threat, paranoid threat, and conspiracy threat. However, outliers were still included in the analyses as it was thought they would provide useful information about expected group differences.

Normality. As assessed by Shapiro-Wilk's test the normality was violated for all belief types across trust and threat ($p < .05$). As there were equal groups, and ANOVAs are robust to non-normality, they were conducted with 5000 bootstrapping.

Homogeneity of Variance. Homogeneity of variance was violated ($p < .001$) for neutral threat and trust, paranoid threat and trust and conspiracy threat as assessed by Levene's test for homogeneity of variance. Welch's F was reported, and Games-Howell post hoc tests were conducted and reported.