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Social identity and psychosis:

**A systematic review of social identity in the context of psychosis and
related experiences**

And

**An empirical research study examining the association between social
identity and paranoia, through the mediators of trust and hostile
attribution bias**

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May 2022

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Lay Summary

Psychosis describes perceiving the world differently to others. Common experiences include delusions (believing things that are culturally unacceptable without much evidence) and hallucinations (seeing or hearing things other people can't). Some people with psychosis are given a diagnosis of schizophrenia. Society has historically seen psychosis as a rare illness that has a great deal of stigma attached. However, research has shown these experiences are common in the general population. Most people have believed that other people have talked about them behind their back, have felt paranoid walking home alone at night or after watching a scary film, or have heard someone call their name when no one was there. These seem to be more frequent in mild forms and less frequent in severe forms and is named the "psychosis spectrum".

It is useful to do research with the general population on what might make someone more or less likely to be at the severe end of the psychosis spectrum. One factor that might affect this is social identity: feeling you belong to a group and this membership being an important part of how you see yourself. This includes many types of groups, such as national (e.g., British), occupational (e.g., a teacher), friendship and family identity. Research suggests the stronger your social identity is with a safe and supportive group, the more protected you are from physical and mental health difficulties. The current research project looked at social identity and psychosis.

Firstly, a systematic review explored what research has been done and what has been found on the link between social identity and psychosis. This meant searching through research databases and carefully checking the summary of each study to see if it was relevant. Fourteen papers were selected and these were judged as moderate to good quality. The findings revealed strong social identity is linked to less psychosis-related experience. The type of social identity seemed to matter: friendship group had the strongest effect on paranoia, and family and neighbourhood identity were also supported by the studies. Ethnic identity seemed to have an indirect effect: just having a strong identity didn't appear to have an impact, but someone also having fewer experiences of racism did. Support was found for national identity, but not political identity. Most studies looked at paranoia (the unsupported belief other people are going to cause you harm) over other psychosis experiences like hearing voices. The evidence so far shows social identity does

impact psychosis, but how these are linked seem to depend on the specific social groups and psychosis experiences.

The second part of this research is a study looking at how family and friendship group identity affects paranoia. There has been some evidence trust is important, possibly because when we identify with a group we build more trusting relationships and are less likely to be paranoid. There is also evidence hostile attribution bias has an impact. This means being biased to judge other people's actions as hostile. If someone has more experience being an outsider, they may be more likely to think other people have bad intentions, and this could result in paranoia. This study aimed to test if there was a link between social identity and paranoia through trust and hostile attribution bias. The researcher also measured schizotypy: a collection of traits related to psychosis seen more commonly in the general population, such as believing unusual things and being socially withdrawn. This was to see if any association was unique to paranoia.

Adults living in the UK were recruited through social media to complete five questionnaires from previous research in an anonymous online survey. A total of 307 people completed all the questionnaires and 48 completed some questionnaires. Most participants identified as female (76.1%) and White British (73%). They were most commonly between 25-34 years old (47.3%) and had an undergraduate degree (43.4%). A higher-than-average number had a diagnosis of schizophrenia (4.8%) or any other mental health difficulty (69%). The results showed stronger social identity predicted lower levels of paranoia. As expected, high social identity led to low hostile attribution bias and higher trust, which caused lower paranoia. Surprisingly, social identity also showed these effects on schizotypy. These findings support that feeling we belong to our family and friendship groups, feeling connected to these groups, is important in protecting us from developing psychosis.

Overall, this research shows us social identity is important in psychosis. People with psychosis are one of the most socially isolated groups due to stigma and the social difficulties that come with the condition. This research tells us more studies are needed into social interventions, such as support groups. It also encourages professionals to think about what groups are important to the people they work with. Finally, as this is quite a new area of research, it gives more direction to what future studies need to focus on and how to design these.

Thesis Portfolio Abstract

Background: It is theorised there are important social factors in the development and maintenance of psychosis. Social identity theory states our sense of belonging to groups is internalised into our personal identity and research has demonstrated social identity is protective against physical and mental health difficulties. There is sound rationale for social identity being associated with psychosis and related experiences, both clinically and in the general population.

Aims: This thesis firstly aimed to conduct a systematic review exploring what research has been done to date exploring social identity in the context of psychosis. The second part of this thesis aimed to conduct an empirical study investigating the association of family and friendship group identity on paranoia, through the mediators of trust and hostile attribution bias.

Method: The systematic review searched nine databases using relevant key words for research papers and judged these against inclusion and exclusion criteria. The quality of the final papers was assessed. A cross-sectional quantitative empirical study was conducted. Adults from the general population, including individuals with and without psychosis, were recruited.

Results: The systematic review revealed fourteen papers relevant to the research question. A narrative synthesis found stronger evidence for direct associations between small group social identities and psychosis-related experiences, and indirect associations for larger group social identities. The quality of papers was moderate to good with strengths in theoretical frameworks and limitations in sample representation. Findings from the empirical study showed social identity was a significant predictor of both paranoia and schizotypy. A mediation analysis found trust and hostile attribution bias significantly mediated this relationship.

Conclusions: The results suggest there is an association between social identity and psychosis-related experiences. The strength of this association seems to depend on the type of social identity and the specific psychosis-related experience. The mechanisms of this relationship appear to be important and vary depending on the precise social identities and experiences. This has implications for considering the importance of social identity. A systematic review of social identity in the context of psychosis and related experiences

Abstract

Background and Hypothesis: The “social cure” suggests belonging to social groups has benefits for physical and mental health. An emerging area of research has tested the association between social identity and psychosis in both clinical and non-clinical populations. The current paper aims to synthesise this evidence.

Design: Searches were conducted on MEDLINE, PsychINFO, EMBASE, ASSIA, CINAHL Plus, IBSS, Scopus Web of Science, Sociological abstracts, and ProQuest Dissertations and theses global databases. Eligible studies were quantitative, conducted in adult populations and measured the association between a social identity and psychosis-related experience, both of which had to be quantified rather than categorically measured. Social identity was defined as a personal sense of belonging to a group. A narrative synthesis was used to review studies.

Results: Fourteen articles were included in the final review. Ethnic identity (42.9%) and paranoia (35.7%) were the most investigated outcomes. Most studies used general population samples (73.7%). A significant association between at least one measure of social identity and psychosis-related experience was identified for 57.9% of studies. There was more evidence of a direct relationship between small group identities, including friendship group and family identity, and psychosis-related experience than with larger group identities, such as ethnic identity. The association between friendship group identity and paranoia was particularly robust. Other larger group identities, including national identity, showed support for indirect associations through mediators and moderators. The quality assessment revealed good overall quality of studies with some limitations.

Conclusions: Research to date has supported an association between social identity and psychosis. The strength and nature of this association seems to depend on the type of group and psychosis-related experience. This review is limited to the social identification definition used, and further reviews may use alternative definitions. It is indicated research should not generalise the “social cure” across different groups and psychosis-related experiences, and further research should explore the precise associations and mechanisms.

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Introduction

Social identity and psychosis

The social identity approach encompasses two theoretical models. The first, social identity theory, argues people attempt to organise the social world into distinct categories, or groups, to make sense of complex information (Tajfel, 1979). These groups are personally meaningful to individuals and influence their identity accordingly, with the interests, behaviours, and attitudes of the group aligning with their own. Social categorisation theory also seeks to understand how and when people will categorise and identify with certain groups (Tajfel, 1986). Thus, an individual moves from seeing themselves as an individual, to viewing themselves as a group member, internalising this membership into their sense of self. All further social interactions and connections are proposed to take place in the context of the group (Cruwys et al., 2014).

Since the conceptualisation of this approach, a vast amount of research has explored the impact of social identity on health and behaviour, coining the term “the social cure” for the positive effects a strong sense of social identity can provide (see Jetten et al., 2012 for a review). There is evidence these groups need to be accepting and supportive, otherwise group membership can have detrimental effects on health (Kellezi & Reicher, 2012). These benefits have been found to be specific to social identity, as confounds of social integration have been controlled for such as number of social contacts (Sani, 2012). The association between social identity and depression has been widely investigated, with a recent meta-analysis reported on 76 studies (Postmes et al., 2019). In contrast, no review has been conducted to date on social identification’s association with psychosis.

Psychosis is a collection of experiences categorised as schizophrenia spectrum and other psychotic disorders, made up of symptoms including delusions, hallucinations, and paranoia (World Health Organization, 2019). Over the past two decades however, research has demonstrated these symptoms are common across the general population, with more severe, distressing and disabling presentations meeting clinical thresholds (van Os & Reininghaus, 2016). It is well documented, for example, that voice hearing is present in individuals without a diagnosis of schizophrenia (Baumeister et al., 2017). One literature review found an average of

19.3% of participants reported hearing unexplained voices at some point in their lives (Beavan et al., 2011). General population studies are therefore relevant to understanding the development and maintenance of psychosis, particularly in establishing protective factors to inform presentation and intervention programmes.

Psychosis is characterised by social difficulties, with social withdrawal established as one of the first indicators of the onset of schizophrenia (Larson et al., 2010). People with psychosis have been documented as one of the most stigmatised groups in society and have significantly impacted quality of life (Degnan et al., 2021). This has further been shown to lead to internalised self-stigma, that has been found to be a barrier to recovery (Morrison et al., 2016). A common and debilitating symptom of psychosis is persecutory delusions; the unfounded belief other people are trying to cause you harm (Freeman, 2007), which consequently leads people to isolate themselves from others out of fear. Furthermore, a longitudinal study found frequent social interactions with friends was a significant positive predictor of recovery over a two-year period for people with psychosis (Bjornestad et al., 2017). Despite the clear importance of social factors in the understanding and treatment of psychosis, the social identity approach has only more recently been applied in this context.

Existing research

There is an emerging and promising evidence base exploring the association between social identity and psychosis-related experiences which is yet to be reviewed. A potential limitation of the literature is irregularity of a clear definition of social identity based on theoretical frameworks and measuring the construct accordingly. For instance, Amedy and colleagues (2020) aimed to investigate the association between social identity and paranoia, however, conceptualise this as belonging derived from individual relationships rather than groups. The Multidimensional Scale of Perceived Social Support (Zimet et al., 1988) is used to measure social identity, yet this does not specify a group or include belonging to said group in the items, rather measuring social contacts and support. It would therefore be useful to establish how social identity is being operationalised, what theoretical underpinnings are referred to, and how these fit with outcome measures used. Determining consistency across studies will allow future research to have a higher standard of reliability.

In addition, the literature appears to investigate various social group identities, including family (Sani, 2012), national (Greenaway et al., 2019) and ethnic (Herdina et al., 2006) identity. National identity refers to the sense of belonging with one's nation, either where one lives currently or where most feels like home (Bauer & Hannover, 2020), whereas ethnic identity is defined as the sense of belonging to one's ethnic group, including multiple ethnicities (Phinney, 1996), and family identity the sense of belonging derived from one's own family (Epp & Price, 2008). The other members, or ingroup members, of national and ethnic identities will include mostly individuals one does not know or have personal connections with, as these refer to large groups of people, whereas individuals will have personal relationships with each member of their family, a far smaller group. It is not clear from the literature if the association with psychosis differs between small and large group social identities, yet the social identity approach to psychosis appears to be generalised across groups (Elahi et al., 2018). Further to this, it is not clear if there are patterns of associations between different social group identities more broadly, or if these associations and mechanisms are more pertinent to some groups over others. For instance, Greenaway and colleagues (2019) found national identity but not political identity was associated with paranoia, suggesting within larger group social identities there may be variation. This review therefore aims to explore what research has found to date for small and large group social identities and compare findings for social identity groups within these distinctions.

A similar shortcoming is observed for psychosis; research has moved away from binary clinical cut-offs as the emergence of the psychosis spectrum has shown symptoms are common in the general population with varying degrees of severity (Guloksuz & van Os, 2018). Nonetheless, research studies have included diagnostic guidelines as measures of schizophrenia and compared these participants with control groups to measure the association with social identity (Veling et al., 2010). Whilst these do have merit for the evidence base, limitations arise in how psychosis is categorised, and outcomes cannot be directly compared to social identity measures to explore associations. The current paper aims to review how social identity has been operationalised and measured to synthesise consistent findings from studies across the psychotic-experience continuum including clinical and non-clinical populations.

Research of clinical samples where the majority of participants have a diagnosis of schizophrenia or other psychosis related disorder is generally sparse. A small body of literature has explored psychosis identity; how people identify with other people who have a diagnosis of psychosis and how this has been incorporated into their sense of self. Perez and colleagues (2021) found participants identified less with the psychosis identity than their carers, and stronger identification predicted poorer psychosocial functioning. An earlier study examined patients with first-episode psychosis and did not find clear effects of schizophrenia identity on insight and functioning over 3 years, with the authors concluding there was a complex interaction between these factors (Klaas et al., 2016). The definition of this as a social identity with groups of other people who share diagnosis, rather than a personal identity of having a diagnosis, is unclear.

Community identity has also received some attention. One longitudinal qualitative study exploring recovery for people of South Asian origin living in Canada identified themes of identity and belonging within their community, highlighting how their diagnosis posed challenges to integration (Virdee et al., 2017). A study of inpatients with psychosis found those who went into the community more often had a stronger sense of community identity, and this remained protected despite time in hospital (Taylor et al., 1991). Whilst these studies explored psychosocial functioning, psychosis-related experience were not quantitatively measured in a comparable way across studies.

Further to this, there seems to be variation in how psychosis is measured in the literature and the theoretical underpinnings to why social identity is implicated. A growing body of literature has specifically investigated an association with paranoia, arguing the social threat element of paranoia means there is a stronger relationship with social identity above other psychosis-related experiences (Greenaway et al., 2019; McIntyre et al., 2016; 2021). This evidence base has been mixed, with McIntyre and colleagues finding some support for social identity and paranoia in university and community samples (McIntyre, Wickham, et al., 2018; McIntyre, Worsley, et al., 2018), however not yielding significant results for direct association of national identity and paranoia in an ethnic minority sample (McIntyre et al., 2021). One longitudinal study of family identity found evidence for a causal relationship with paranoia and also anomalous experiences (Sani et al., 2017), questioning the

proposal of a paranoia-specific relationship. As a result, the current review aims to synthesise this research to gain a better understanding of the associations between social identity and different psychosis-related experiences.

Finally, authors have hypothesised various indirect associations between social identity and psychosis through potentially related variables. Among these are trust (Greenaway et al., 2019) and self-esteem (McIntyre et al., 2016; McIntyre, Wickham, et al., 2018). As with variations in social identities and psychosis-related experiences, it will be useful to synthesise the findings of indirect associations to inform future research. A systematic review of this literature would help to understand variation in theoretical underpinnings, methodology, and findings to shape the direction of ongoing research.

Purpose and aims of review

In response to these irregularities within the literature, it was judged pertinent to conduct a systematic review of the evidence base to date. The primary goal of this systematic review was to address the question of what research has found to date investigating social identity within the context of psychosis and related experiences. It further aimed to review how social identity has been defined and operationalised in the literature, and how social identity and psychosis have been measured. Finally, it aims to synthesise the findings for different psychosis-related experiences, such as paranoia and voice hearing, and social identities, for instance smaller groups and larger groups.

Methods

Protocol and registration

A protocol for this review was submitted to PROSPERO register of systemic reviews on 5th October 2021 available on

https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42021277336. The review follows PRISMA guidelines for reporting (Moher et al., 2009).

Eligibility criteria

To be included in this review papers had to meet the following criteria: i) quantitative research ii) participants are over 18 years of age iii) measures the relationship between a social identity and psychosis-related experience iv) psychosis-related

experience is unrelated to substance use, physical condition, side effects of prescribed medication or dementia v) the social identity measure used included the measurement of belonging to a group vi) paper is available in English. Papers were excluded if: i) the social identity measure was not specific to belonging to social groups, for example using a national identity measure assessing language use or nationality of television shows watched, or ii) data was categorical only, for example a yes/no diagnosis of schizophrenia.

Information sources

Searches were conducted on the MEDLINE, PsychINFO, EMBASE, ASSIA, CINAHL Plus, IBSS, Scopus Web of Science, Sociological abstracts, and ProQuest Dissertations and theses global databases up to the search date 19th November 2021. Final articles selected were manually searched for reference of further papers relevant to the research question. Where papers were not accessible authors were contacted by email to request access.

Search strategy

Search terms to capture social identity were: Social identi* OR Group identi* OR Group member* OR Social group OR Social connect* OR ethnic identi* OR Racial identi* OR Sexual identi* OR Cultural identi* OR Family identi* OR Friend identi* OR Political identi* OR Occupational identi* OR Professional identi* OR Gender identi* OR Belonging OR Connect* OR Ingroup OR Outgroup OR Acculturation. This was combined using AND with psychosis-related experiences search terms: Psychosis OR Psychotic OR Schizo* OR Hallucinat* OR Paranoi* OR Delusion* OR Severe mental OR Serious mental. The initial database searches set limits to search key terms in title and abstracts only to increase the chances of capturing eligible papers.

Study selection

Initial searches were imported into Covidence online systematic review management software, where duplicates were removed before titles and abstracts were screened based on the inclusion and exclusion criteria.

Data collection process

The reviewer extracted relevant data and entered this into an Excel spreadsheet. The extracted data items included: authors; publication date; paper title; publication

type; country of study; research aims; definition of social identity; type of social identity measured; psychosis-related experience measured; study design; population; number of participants; demographics; social identity outcome measure; psychosis-related experience outcome measure; any other outcome measures used; statistical analysis conducted and key findings.

Risk of bias

Quality appraisal was conducted using the Quality Assessment Tool for Studies with Diverse Designs (QATSDD; Sirriyeh et al., 2012). The QATSDD was chosen as it is flexible to use across study designs and has a standardised approach to quality assessment regardless of methodology. It was expected the identified literature would include studies from the field of sociology and social psychology, as well as clinical psychology and healthcare, therefore the QATSDD allows unbiased appraisal across these fields. Furthermore, the checklist items were particularly relevant to the research questions; the item evaluating theoretical frameworks is useful to assess how social identity is conceptualised in the literature, and the items evaluating outcome measures are pertinent to the question of how social identity and psychosis-related experiences are measured.

The final quality assessment included 15 items, removing the qualitative specific items and adding an additional question evaluating how clearly defined social identity is within the article. These items were: 1) explicit theoretical framework 2) clear definition of social identity 3) statement of aims/objectives 4) clear description of research setting 5) evidence of sample size considered in terms of analysis 6) representative sample of target group of a reasonable size 7) description of procedure for data collection 8) rationale for choice of data collection tool(s) 9) detailed recruitment data 10) statistical assessment of reliability and validity of measurement tool(s) 11) fit between stated research question and method of data collection 12) fit between stated research question and method of analysis 13) good justification for analytical method selected 14) evidence of user involvement in design 15) strengths and limitations critically discussed. The full tool is outlined in Appendix A. Each item was scored either 0 not at all, 1 very slightly, 2 moderately or 3 complete. This measure does not include criteria cut-offs for quality, such as poor or acceptable, as the authors argue there is no evidence to support the distinction,

instead allowing researcher discretion which was deemed appropriate for the narrative synthesis of this review.

Synthesis of results

A narrative synthesis was used to present the relevant data. Effect sizes of each analysis of the association between social identity and psychosis-related experiences were reported on for consistency between studies.

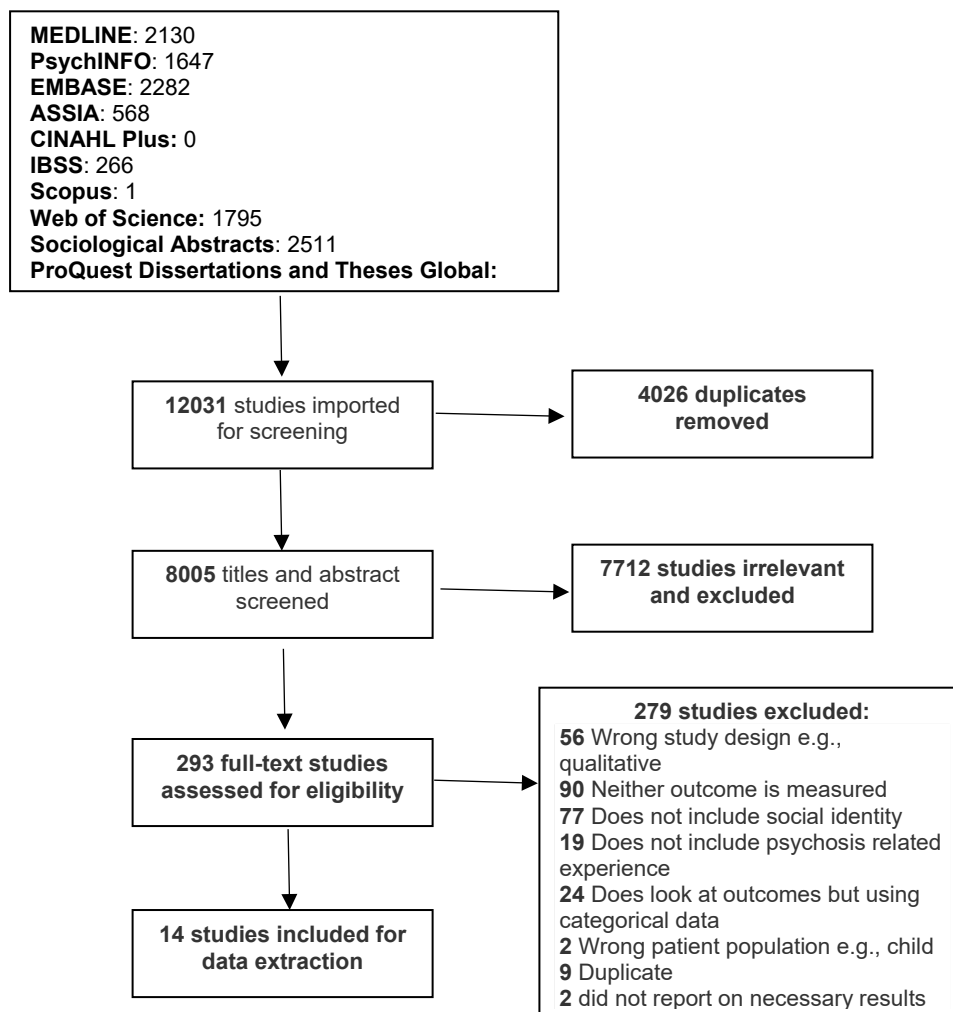
Results

Study selection

The full search strategy can be seen in Figure 1. The final search established 14 relevant papers.

Figure 1.

Full review search strategy



Study characteristics

Full details on study and participant characteristics are outlined in Table 1. Fourteen articles were identified from 1999 to 2019. Three studies were doctoral theses (Gonzales, 2003; Kim, 2001; Prince, 1999) and the remaining 11 were journal articles. Four publications reported on more than one study, with Greenaway et al. (2019) conducting five studies. There was duplication of datasets across four studies. One dataset was replicated across Elahi et al. (2018) study 1 and McIntyre, Wickham, et al. (2018) study 1, and one dataset was replicated across and McIntyre, Worsley, et al. (2018) and McIntyre, Wickham, et al. (2018) study 2. Therefore, within the 14 papers there are a total of 21 empirical studies using 19 samples.

The following summary of participant characteristics will be based on 19 studies omitting McIntyre, Wickham, et al. (2018) study 2 and Elahi et al. (2018) study 1. Research was predominately conducted in either the USA ($n= 10$, 52.6%) or UK ($n= 4$, 21.1%). The majority of studies included general population samples ($n= 15$, 79%), with over half of these being university students ($n= 8$, 42.1%). One study used a clinical sample where all participants had a psychiatric diagnosis including 61.6% with schizophrenia (Prince, 1999). Another study used a homeless population sample (Herdina et al., 2006) and one study included participants accessing psychotherapy (Gonzales, 2003). Neither of the two subsequent papers reported diagnostic categories for their samples. Sample sizes ranged from 82 to 4319, with an average (mean) of 678. The mean age of participants ranged from 19.31 to 74.1 years, with an average across studies of 33.08 years. Fourteen studies reported over 50% of their sample was female. Eight studies did not provide information on ethnicity of participants and two studies partially reported ethnicity. The studies that did report showed ethnic diversity of participants.

There were seven papers that explicitly aimed to explore the association between social identity and a psychosis-related experience (Anglin et al., 2018; Greenaway et al., 2019; McIntyre et al., 2021; McIntyre, Wickham, et al., 2018; Sani et al., 2017; Thomas et al., 2017; Velthorst et al., 2012). Other papers aimed to either explore the wider associations between social identities and mental health symptomology (Elahi et al., 2018; Gonzales, 2003; Herdina et al., 2006; McIntyre, Worsley, et al., 2018; Prince, 1999), associations between other factors and psychosis-related experiences

(Cicero & Cohn, 2018), or alternative aims where both measures were additional outcomes (Kim, 2001).

Table 1

Study characteristics

Author & year	Country of study	Study design	Population	Number of participants	Demographics (Gender; Age in years <i>Mean (standard deviation)</i> ; Ethnicity)	Category of social identity and measure	Psychosis-related experience and measure	Total Quality Score (QATSD)
Anglin et al. 2018	Northeast, USA	Cross-sectional	Ethnic minority Undergraduate students	644	65% female; 19.9 (2.11); 32.8% Black, 27.5% Asian, 24.2% Hispanic, 15.6% Other	Ethnic identity: MEIM-R ¹	Attenuated positive psychotic symptoms (APPS); PQ; Positive subscale	33
Cicero & Cohn, 2017	Hawaii, USA	Cross-sectional	Undergraduates at public Pacific university	663	73.0% female; 20.50 (4.10); 23.7% White, 27.7% Asian, 16.2% Pacific Islander, 28.0% Multi-ethnic, 1.6% African American, and 2.7% Hispanic	Ethnic identity: MEIM-R	Schizotypy: Perceptual Aberration & Magical ideation	29
Elahi et al. 2018 Study 1	England, UK	Cross-sectional	Large household health survey in Northwest England	4319	57% female; 49.12 (3.65); 89% White European (no further information)	Neighbourhood identity: UK Community Life Survey (2015); single item	Paranoia: PaDS; five items from persecution subscale	32
Elahi et al. 2018 Study 2	England, UK	Cross-sectional	Student mental health survey in Universities in England and Wales.	612	64% female; 21.61 (3.65); 14% Black or another minority ethnic group (no further information)	Neighbourhood identity: Doosje et al (1995); two items	Paranoia: PaDS; five items from persecution subscale	28
Gonzales, 2003	New York, USA	Cross-sectional	Community older adults over 65 years in psychotherapy	311	65% female; 74.1 (6.91); 53% Black (no further information)	Ethnic identity: MEIM	Paranoia: BSI; Paranoid Ideation Subscale	37
Greenaway et al. 2019 Study 1	USA	Cross-sectional	American community adults	800	50% female; 37.64 (11.88); Not reported	Political and national identity: FSIS	Paranoia: Three-item measure of paranoia (Haslam & Reicher, 2006)	32
Greenaway et al. 2019 Study 2	USA	Cross-sectional	American community adults	779	50% female; 36.88 (12.56); Not reported	Political and national identity: FSIS	Paranoia: Three-item measure of paranoia (Haslam & Reicher, 2006)	29
Greenaway et al. 2019 Study 3	USA	Cross-sectional	American community adults	784	54% male; 34.56 (11.52); Not reported	Political and national identity: FSIS	Paranoia: Two-item measure of paranoia (Haslam & Reicher, 2006)	29
Greenaway et al. 2019 Study 4	USA	Between-subjects experimental	American community adults	390	51% female; 35.66 (11.28); Not reported	National identity: FSIS	Paranoia: Two-item measure of paranoia (Haslam & Reicher, 2006); Paranoia scale	30

Greenaway et al. 2019 Study 5	USA	Between-subjects experimental	American community adults	904	52% female; 34.52 (11.56); Not reported	National identity: FSIS	Paranoia: Two-item measure of paranoia (Haslam & Reicher, 2006)	30
Herdina et al. 2006	California, USA	Cross-sectional	Homeless adults in East LA either on the streets or residential facilities	355	66.2% male; 40.8 (10.8); 34.6% White, 33.8% Latino, 24.8% African American, 6.8% Native American	Ethnic identity: MEIM	Psychosis: BASIS-32; Psychosis subscale	30
Kim, 2001	California & Hawaii, USA	Cross-sectional	Asian-American college students	241	55% female; Not reported; 69.8% Asian, Asian American, or Oriental, 21.3% Caucasian, White, European American, not Hispanic, 10% unknown	Ethnic identity: MEIM	Paranoid ideation and psychoticism: Brief Symptom Inventory (BSI) - Paranoid Ideation and Psychoticism subscales	31
McIntyre, Wickham et al. 2018 Study 1	England, UK	Cross-sectional	UK community adults	4319	57% female; 49.12 (19.13); 89% white European	Neighbourhood identity: UK Community Life Survey; single item	Paranoia: PaDS; five items from persecution subscale	36
McIntyre, Wickham et al. 2018 Study 2	Northern England, UK	Cross-sectional	University students in North West England	1167	69% female; 20.78 (4.35); 80% white European	Country of origin, England university city, university, university friendship group, and online community identity: Doosje et al. (1995) three-item scale	Paranoia: PaDS; five items from persecution subscale	33
McIntyre, Worsley et al. 2018	Northern England, UK	Cross-sectional	University students in north England	1135	64% female; 20.78 (4.35); 82% white	Country of origin, England university city, university, university friendship group, and online community identity: Doosje et al. (1995) three-item scale	Paranoia: PaDS; five items from persecution subscale	32
McIntyre et al. 2021	UK	Cross-sectional	Black African, Black Caribbean, mixed-race Black African or mixed-race Black Caribbean UK residents	338	68.4% female; 32.62 (11.45); 59.2% Caribbean heritage, 40.8% African heritage	British identification: FIS1	Paranoia: PaDS	38
Prince, 1999	Ontario, Canada	Cross-sectional	People with serious mental illness in the community attending assertive community treatment (ACT)	82 (based on total sample of 317)	59.3% male; 44.3 (10.9); Not reported	Neighbourhood identity: Psychological Integration Scale	Positive and negative symptoms: BPRS	37
Sani et al. 2017	Cyprus	Cross-sectional	University students	108	83.8% male; 23.34 (3.43); Not reported	Family identity: GIS	Paranoia: Paranoia scale	28

Study 1								
Sani et al. 2017 Study 2	Valencia, Spain	Longitudinal	University students	206	80.1% female; 19.31 (1.52); Not reported	Family identity: GIS	Paranoia: Paranoia scale Anomalous experiences: Unusual Experiences Scale	29
Thomas et al. 2017	Abu Dhabi, UAE	Experimental	University students at Emirati college	208	100% female; 25.36 (4.51); 100% Emirati	National identity: MIIS	Paranoia: PaDS	31
Velthorst et al. 2012	The Netherlands	Cross-sectional	Ethnic minority group in Dutch Early Detection and Intervention trial	87	55.2% female; 24.5 (5.5); 25.3% Moroccan, 18.4% Surinamese, 4.9% Turkish, 16.1% other Western, 25.3% other non-Western	Ethnic and national identity: ICSEY scale	At-risk mental state (ARMS): CAARMS	23

Note. Abbreviations are as follows: The Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992), Multigroup Ethnic Identity Measure-Revised (MEIM-R; Phinney & Ong, 2007), Multicomponent in-group identification scale (MIIS; Leach et al., 2008), Group Identification Scale (GIS; Miller et al., 2015), Four Item measure of Social Identification (FISI; Postmes et al., 2013), International Comparative Study of Ethnocultural Youth (ICSEY) scale, 10-item version of Multigroup Ethnic Identity Measure (Phinney, 1992), Psychological Integration Scale (Perkins et al., 1990), The Comprehensive Assessment of At Risk Mental States (CAARMS; Yung et al., 2005), The Persecution and Deservedness Scale (PaDs; Melo et al., 2009), Paranoia scale (Fenigstein & Venable, 1992), Brief Psychiatrist Rating Scale (BPRS; Overall, 1962), Behavior and Symptom Identification Scale (BASIS-32; Eisen & Culhane, 1999): Psychosis subscale, Perceptual Aberration Scale (PerAb; Chapman et al., 1978), Magical Ideation Scale (Magid; Eckblad & Chapman, 1983); Brief Symptom Inventory: Paranoid Ideation Subscale (BSI; Derogatis & Melisaratos, 1983); Prodromal Questionnaire (PQ; Loewy et al., 2005); Unusual Experiences Scale.

Definition and measurement of social identity

The 21 research studies will be outlined in the following synthesis. The papers using duplicated datasets addressed different research questions, used varying outcome measures, and conducted separate analyses.

Regarding theoretical frameworks of social identity, the authors base their research in one of two models. Five papers reference Phinney and Ong's (2007) theoretical framework of ethnic identity and acculturation (Anglin et al., 2018; Cicero & Cohn, 2018; Gonzales, 2003; Kim, 2001; Velthorst et al., 2012), whilst seven authors define social identity within the social identification model outlined by Tajfel (1979) and the additional social cure model (Elahi et al., 2018; Greenaway et al., 2019; Jetten et al., 2012; McIntyre et al., 2021; McIntyre, Wickham, et al., 2018; McIntyre, Worsley, et al., 2018; Sani et al., 2017; Thomas et al., 2017). Two papers do not define social identity (Herdina et al., 2006; Prince, 1999). Overall, this was a strength of the literature and rated highly on the QATSDD. The most common social identity measured was national identity ($n = 10$, 47.6%), with other studies exploring ethnic, political, neighbourhood, family, friendship, and university identities.

A subsection of studies used outcome measures derived from an area of literature attempting to measure social identification based on the Tajfel (1979) definition (Elahi et al., 2018; Greenaway et al., 2019; McIntyre et al., 2021; McIntyre, Wickham, et al., 2018; McIntyre, Worsley, et al., 2018; Sani et al., 2017). These included the Group Identity Scale (Sani et al., 2015), Four-Item Group Identification Scale (Postmes et al., 2013a), Doosje et al. (1995) scale, and single item from the UK Community Life Survey (Elahi et al., 2018). There were clear themes across these outcome measures of belonging, commitment, similarity, and the group being an important part of identity. This literature has provided evidence of good to excellent criterion validity between the Four-Item Group Identification Scale and other social identification measures (Postmes et al., 2013a). Sani et al. (2017) used the Group Identification Scale which has strong correlation with the Doosje et al. (1995) four-item measure ($r = .92$) and Postmes et al (2013) single item measure ($r = .87$; Sani et al., 2015).

Papers following Phinney and Ong (2007) ethnic identity theory used the authors' measure or a revised version (MEIM; Phinney, 1992; Anglin et al., 2018; Cicero &

Cohn, 2018; Gonzales, 2003; Herdina et al., 2006; Kim, 2001). The MEIM includes subscales of commitment and exploration; commitment is defined as belonging to a social group, and exploration is the ongoing process of learning about one's ethnic and cultural identity. Whilst the commitment subscale corresponds with the above-mentioned measures, exploration appears to be exploring a different process not investigated by measures such as the Group Identification Scale. This may highlight a specific process to ethnic identity and the authors showed due consideration of the multifaceted presentation ethnic identity can take, particularly with participants who were of the minority ethnic group where they lived (Cicero & Cohn, 2018). This draws attention to issues in directly comparing findings to other social identities. Of interest, Thomas et al. (2017) applied alternative indicators of cultural and national identity in addition to the MIIS by conducting an affective priming task to assess implicit in-group evaluations. Whilst this measure alone would not have met the current inclusion criteria, it highlights the variation in measures of social identity.

Definition and measurement of psychosis-related experiences

Paranoia was the most common experience measured (n= 5, 35.7%) and several papers referenced the evidence base of paranoia being on a continuum (Freeman et al., 2005) as rationale for using general population samples. This was further seen in the studies investigating schizotypal traits and prodromal or at-risk states more commonly found in general population samples (Anglin et al., 2018; Cicero & Cohn, 2017; Velthorst et al., 2012). The studies aiming to explore mental health symptomology more generally used broad measures where psychosis-related experiences were subscales (Herdina et al., 2006; Kim, 2001). These were rated more moderately in the quality appraisal as more reliable measures could have been used, for example the BASIS-32 psychosis subscale has been found to have poor reliability and the subscales highly correlated with each other (Chow et al., 2001).

Quality of studies

The outcome of the quality assessment is shown in Table 2. A second reviewer scored the QATSDD for a random selection of 20% of the papers. There was 80% agreement of scores between reviewers. Disagreements were resolved through discussion. A strength across studies is the rooting of research questions in theoretical frameworks and fully operationalising social identity as a term. The

papers scoring low on these items limited their introductions to outlining previous research (Herdina et al., 2006; Velthorst et al., 2012). All studies clearly stated their aims and objectives. Most studies provided specific detail of the setting, including geographical location, population, and context. Lower scores were given when the study did not provide a clear rationale to why the population or setting was chosen in relation to research question (Cicero & Cohn, 2018), or certain details were omitted, for example not specifying the location within a country (Greenaway et al., 2019).

A strength of studies was large sample sizes, although very few studies reported on their power analysis (Greenaway et al., 2019; McIntyre et al., 2021). Several studies were limited by using university student populations without explaining how this related to their research question (e.g., McIntyre, Wickham, et al., 2018, study 2; Sani 2017). Six studies had good representation of ethnic groups, either within the general population or their target population (e.g., Anglin et al., 2018; Cicero & Cohn, 2018; Gonzales, 2003; Herdina et al., 2006; Kim, 2001; Velthorst et al., 2012). A few studies did not report on ethnicity (Greenaway et al., 2019; Prince, 1999; Sani et al., 2017) and this may have been useful for Greenaway et al. (2019), who explored national identity, alongside information on immigration status. Evaluations of the representation of ethnicity were considered within research questions, likely as ethnic identity was the most commonly measured. Thomas et al. (2017) specifically investigated group preferences and language dominance in Emirati women, this was scored as very slightly representative as the sample was female students only. Kim (2001) looked at international conflict specific to Asian-American College students and McIntyre et al., (2021) explored British identification in black participants from African and African Caribbean backgrounds. Most studies could have obtained higher scores with more equal gender splits and variation of populations studied.

The detail provided on how data was collected was varied; studies with higher scores gave sufficient information to replicate the study (e.g., McIntyre, Wickham, et al., 2018, study 1; Prince 2001; Thomas et al., 2017). An area of limitation for some studies with moderate scores or lower was lacking detail regarding recruitment process (e.g., Cicero & Cohn, 2018) and order measures were completed (e.g., McIntyre et al., 2021) in a way to ensure the study could be replicated. A strength of studies was the robustness of analytical methods used and the majority conducted statistical analysis to determine the validity of outcome measures. In terms of

outcome measures, studies with lower scores could have provided stronger rationales for choices (e.g., Greenaway et al., 2019; McIntyre, Worsley, et al., 2018) and were inconsistent with reporting reliability and validity from previous studies (McIntyre, Wickham, et al., 2018; Sani et al., 2017). The fit between outcome measures and research question was robust. Studies with higher scores used comprehensive batteries of reliable measures (e.g., Anglin et al., 2018; McIntyre et al., 2021; Prince, 1999), whilst others were limited in their measures of possible confounding variables (Sani et al., 2017; Thomas et al., 2017), or were restricted in using single item measures without rationale (e.g., Greenaway et al., 2019).

Most studies used suitable analytical methods, for example using linear, hierarchical, and multiple regression analyses to test association models, including mediator and moderator models. Studies were highly rated for conducting follow up exploratory analyses where appropriate (e.g., McIntyre, Worsley, et al., 2018; Velthorst et al., 2012). No study conducted an inappropriate method of analysis. Quality could be improved in the rationale provided for statistical tests, with some studies either not providing justification or briefly explaining the analysis was chosen to explore the research question without further detail (Cicero & Cohn, 2018; Greenaway et al., 2019; Sani et al., 2017; Thomas et al., 2017).

User involvement was not evident in any study. The majority used general population samples and user design more commonly refers to healthcare service users, therefore this may not be a relevant item to the current review. However, the studies investigating specific populations did not mention consideration of user involvement (Gonzales, 2003; Herdina et al., 2006; Prince, 1999; Velthorst et al., 2012).

Table 2

Quality assessment QATSDD scores

Author & year ¹	Theoretical framework	Social identity definition	Aims	Setting description	Sample size calculation	Sample representation	Procedure outlined	Data collection rationale	Recruitment detail	Reliability/validity measures	Data collection fit	Analysis fit	Analysis rationale	User involvement	Critique
McIntyre et al, 2021	3	3	3	3	3	2	1	3	2	3	3	3	3	0	3
Gonzales, 2003	3	3	3	3	0	3	2	3	3	3	2	3	3	0	3
Prince, 1999	3	3	3	3	0	1	3	3	3	3	3	3	3	0	3
McIntyre, Wickham et al, 2018 Study 1	3	3	3	3	0	2	3	2	3	3	2	3	3	0	3
Anglin et al 2018	3	3	3	3	0	2	2	2	2	3	3	2	3	0	2
McIntyre, Wickham et al, 2018 Study 2	3	3	3	3	0	2	1	2	3	3	2	3	2	0	3
Elahi et al, 2018 Study 1	3	3	3	3	0	2	2	1	3	3	2	3	2	0	2
Greenaway et al, 2019 Study 1	3	3	3	2	2	2	2	2	2	3	2	3	0	0	3
Herdina, et al, 2006	2	0	2	3	0	3	2	3	3	3	2	3	2	0	2
McIntyre, Worsley et al, 2018	3	3	3	3	0	2	1	2	2	2	3	3	3	0	2
Kim, 2001	3	3	3	3	0	2	3	3	3	3	3	3	3	0	2
Thomas et al, 2017	3	3	3	3	0	1	3	2	2	3	2	3	1	0	2
Greenaway et al, 2019 Study 4	3	3	3	2	2	2	2	1	0	3	2	3	1	0	3
Greenaway et al, 2019 Study 5	3	3	3	2	2	2	2	1	0	3	2	3	1	0	2

Cicero & Cohn, 2017	3	3	3	2	0	2	2	2	0	3	2	3	1	0	3
Greenaway et al, 2019 Study 2	3	3	3	1	2	2	2	2	0	3	2	3	0	0	3
Greenaway et al, 2019 Study 3	3	3	3	1	2	2	2	1	0	3	2	3	1	0	3
Sani et al, 2017 Study 2	3	3	3	3	0	1	2	2	0	3	2	2	1	0	3
Sani et al, 2017 Study 1	3	3	3	3	0	1	2	2	0	3	2	2	1	0	3
Elahi et al, 2018 Study 2	3	3	3	3	0	2	1	1	0	3	2	3	2	0	2
Velthorst et al, 2012	0	0	3	3	0	2	2	1	1	0	3	3	2	0	3

Note. Scoring rated on how the item was met according to criteria from 3 = complete; 2 = moderately; 1 = very slightly; 0 = not at all

Papers are ordered in total scores on the QATSDD

Italics indicate where the rating was based on the same information as the first study e.g., aims of both studies included in the introduction

What research has found to date investigating social identity within the context of psychosis and related experiences?

Seventeen of these studies used a cross-sectional design, with one paper using a two-wave longitudinal design (Sani et al, 2017), and two using an experimental design to attempt to manipulate social identity (Greenaway et al. 2019). A full description of findings is presented in Table 3.

Large social groups: Ethnic, political, and national identity.

Of the five studies which investigate ethnic identity and psychosis-related experiences, one found a direct association and four found only indirect associations. The effect sizes were inconsistent and ranged from small to large. The indirect effects included factors such as ethnicity, racial discrimination, and aberrant salience. Almost all associations were in the expected direction, however Gonzales (2003) found high ethnic identity in black participants was associated with higher paranoid ideation. This paper also reported no main effect of ethnic identity on paranoid ideation (Gonzales, 2003). A study investigating Emirati college students found only the stereotype subscale of the MIIS was associated with paranoia and this was a small effect size ($r = -.15$), whilst other subscales of the national identity measure were not significant (Thomas et al, 2017).

Two studies explored ethnic identity's association with psychosis-related symptoms in ethnic diverse undergraduate samples. Neither found significant results for this association (Anglin et al, 2018; Cicero & Cohn, 2017). Herdina et al. (2006) did not report specific analysis on ethnic identity on psychosis, however an ANOVA did reveal a significant, medium sized effect of ethnic identity on a larger measure including a psychosis subscale in a population of homeless adults ($\eta^2 = .12$). Furthermore, the authors report that psychosis was the only subscale significantly affected by the independent variables including ethnic identity ($\eta^2 = .06$). Velthorst et al. (2012) also measured at-risk symptoms and did find a significant association with ethnic identity. These were large effects across the at-risk symptom measure, ranging from $r = -.53$ to $-.69$.

The findings suggest more robust indirect associations through mediators and moderators (Table 3), and these were particularly present where direct effects were not significant. Cicero and Cohn (2017) found ethnic identity was only negatively

associated with measures of schizotypy when aberrant salience scores were high, a cognitive bias to assign importance to otherwise innocuous stimuli and reported a medium effect ($\beta = -.33$). Anglin et al. (2018) found a significant interaction between racial discrimination and ethnic identity, where those with low ethnic identity showed higher average increase on prodromal symptoms when racial discrimination increased, and this was a notably large effect size ($\beta = .95$). In addition, Gonzales (2003) found the interaction between ethnicity and ethnic identity was significant for paranoia and reported a small effect size ($\eta^2 = .03$). These three studies suggest that although ethnic identity may not be directly associated with psychosis-related experiences, it may be indirectly associated through other mechanisms.

Regarding the ten studies investigating national identity, six found either a direct or indirect association on psychosis-related experiences. Effect sizes for direct associations were generally small, whereas for indirect associations all medium effects sizes were reported. All of these effects were in the expected directions.

Greenaway et al (2019) found a negative direct effect of national identity on paranoia across four out of five studies with large sample sizes, although these were all small effect sizes. The same study did not find a significant association with political identity. This may suggest different groups may have different associations with paranoia. The authors did attempt to manipulate national identity with an experimental paradigm; however, this was only successful after participants with extreme scores were removed on one measure of paranoia. Two high quality studies analysing overlapping samples who completed the same measures found conflicting evidence for country-of-origin identity; McIntyre, Wickham, et al. (2018, study 2) found a small significant effect of identity on paranoia ($\beta = -.08$), whereas McIntyre, Worsley, et al. (2018) reported non-significant results. Velthorst et al (2012) also did not find an association between national identity and at-risk symptoms, as with McIntyre et al. (2021), who reported non-significant results for the association between national identity and paranoia within a sample of people from African and African Caribbean backgrounds in the UK.

Two studies investigated mediators of national identity on paranoia. Study 3 in Greenaway et al. (2019) found evidence stronger national identities predicted higher trust and control, which in turn predicted lower paranoia. These were both medium effect sizes ($\beta = .47$, $\beta = .30$) and therefore stronger than the direct effect of national

identity on paranoia across all studies. In a sample of black British participants from African and African Caribbean backgrounds, McIntyre and colleagues (2021) found a medium, significant negative effect via locus of control at high levels of positive contact with white people, and low levels of negative contact. Furthermore, they found significant positive indirect effect at high levels of negative contact and low levels of positive contact. These findings were not replicated for self-esteem. Thus, these results show a mixed picture for the indirect effects of large social group identity on psychosis-related experiences.

Table 3.

Study findings

Author & year	Statistical test(s) used	Social identity and psychosis-related experience	Direct associations between social identity and psychosis-related experience		Indirect effects
			Correlational	Regression/t-test/ANOVA/MANOVA	
Anglin et al, 2018	Linear regression	Ethnic ID & Attenuated positive psychotic symptoms	-.028	Non-significant	High ethnic ID had a significant indirect effect on APPS through racial discrimination ($\beta = 0.95^{***}$, SE = .25, CI [.56 – 1.34])
Cicero & Cohn, 2017	Hierarchical regression	Ethnic ID and Perceptual Aberration/Magical ideation	Full measure: -.01 Commitment subscale: .02 Exploration subscale: -.04	Non-significant	No significant interaction for full measure or commitment subscale Exploration subscale of ethnic ID only negatively associated with PLEs when aberrant salience was high ($\beta = -.33$, $t(608) = -2.257$, $p = .027$)
Elahi et al, 2018 Study 1	Moderated mediation	Neighbourhood ID & paranoia	-.14 ^{***}	Not tested	Neighbourhood ID (moderator) had an indirect effect on paranoia (DV) through financial stress (IV) and self-esteem (mediator) Low Neighbourhood ID ($\beta = .09^*$, SE = .01, CI [.07 - .11]) High Neighbourhood ID ($\beta = .06^*$, SE = .01, CI [.04 - .07])
Elahi et al, 2018 Study 2		Neighbourhood ID & paranoia	Host town identity: -.16 ^{**} Hometown identity: -.16 ^{**}	Not tested	Host town ID (moderator) had an indirect effect on paranoia (DV) when low through financial stress (IV) and self-esteem (mediator), irrespective of hometown ID (moderator) Low host town ID and low hometown ID ($\beta = .21^*$, SE = .09, CI [.04, .39]) Low host town ID and high hometown ID ($\beta = .34^*$, SE = .10, CI [.16, .54])
Gonzales, 2003	Two-way ANOVA	Ethnic ID & paranoia	.06	Non-significant	Significant interaction between ethnicity and ethnic ID for paranoid ideation ($F(1, 311) = 10.81$, $p < .01$, $n^2 = .03$) Black participants with high ethnic ID reported significantly higher paranoid ideation than black participants with low Ethnic ID.
Greenaway et al, 2019 Study 1	Hierarchical regression	Political & national ID & paranoia	Political ID: -.11 ^{**} National ID: -.09 ^{**}	Non-significant	
Greenaway et al, 2019 Study 2	Hierarchical regression	Political & national ID & paranoia	Political ID: -.02 National ID: -.14 ^{***}	Political ID non-significant National ID $\beta = -0.09^*$	

Greenaway et al, 2019 Study 3	Hierarchical regression & mediation	Political & national ID & paranoia	Political ID: -.06 National ID: -.11**	Political ID non-significant National ID $\beta = -0.10^*$	Significant indirect association through trust and control (mediators) Trust: National ID, $\beta = 0.47^{***}$ Control: National ID, $\beta = 0.30^{***}$ Political ID $\beta = 0.07^*$
Greenaway et al, 2019 Study 4	Hierarchical regression	National ID & paranoia	National identity Paranoia (2 items): -.10* Paranoia (20 items): -.18**	Paranoia (20 items): $\beta = -0.13^{**}$ Manipulation non-significant Paranoia (2 items) non-significant	Significant indirect association through trust and control (mediators): Measured ID – Control – Paranoia (2-items): $\beta = -.13^*$ Measured ID – Trust – Paranoia (2-items): $\beta = -.11^*$ Measured ID – Control – Paranoia (20-items): $\beta = -.06^*$ Measured ID – Trust – Paranoia (20-items): $\beta = -.08^*$ Significant indirect association of manipulated ID through measured ID: Paranoia (2-items): $\beta = -.03^*$ Paranoia (20-items): $\beta = -.03^*$
Greenaway et al, 2019 Study 5	Hierarchical regression & mediation	Political & national ID & paranoia	-.13***	National ID: $\beta = -0.09^{**}$ Manipulated non-significant Meta-analysis: National ID: ($r_z = -.09$, $SE = .02$, $z = -5.64^{***}$, 95% CI [-0.13, -0.06]) Political ID non-significant	Significant indirect effects: Manipulated ID – Measured ID – Control – Paranoia (2-items): $\beta = -.05^*$ Manipulated ID – Measured ID – Trust – Paranoia (2-items): $\beta = -.05^*$ Manipulated ID – Measured ID – Control – Paranoia (20-items): $\beta = -.02^*$ Manipulated ID – Measured ID – Trust – Paranoia (20-items): $\beta = -.04^*$
Herdina, et al, 2006	MANOVA	Ethnic ID & psychosis	-.04	$F(5,82) = 2.28^*$, $n^2 = .12$	
Kim, 2001	MANCOVA	Ethnic ID & Paranoid ideation & psychoticism	Paranoia -.22* Psychoticism -.15*	Not tested	Significant indirect effect on MEIM Affirmation, belonging, commitment subscales for entire BSI measure ($F(9, 89) = 3.69^{***}$, $n^2 = .11$)
McIntyre, Wickham et al, 2018 Study 1	Mediation	Neighbourhood ID & paranoia	-.14***	Paranoia: ($\beta = -.05^*$, $SE = -.01$, CI [-.08, -.03]) AVH: non-significant	Significant indirect effect of neighbourhood ID on paranoia mediated by self-esteem ($\beta = -.01^{***}$, $SE = .002$, CI [-.013, -.005])
McIntyre, Wickham et al, 2018 Study 2	Hierarchical regression & mediation	Country of origin, England university city, university, university friendship group, & online community & paranoia	-.25***	Country of birth: $\beta = -0.08^*$ Friendship group: $\beta = -0.26^{***}$ England, university city, university & online community: non-significant	Significant indirect effect of friendship group ID on paranoia mediated by self-esteem (IE= -.02, SE= .01, CI [-.04, -.01]) 17% of total effect of friendship group ID on paranoia mediated by self-esteem Combined ID measures significantly contributed to model for paranoia ($R^2 = .09$, $F(6, 1087) = 16.18^{***}$) Combined ID measures significantly contributed to model for AVH ($R^2 = .01$, $F(6, 1087) = 2.67^*$)

McIntyre, Worsley et al, 2018	Hierarchical regressions, multiple regressions and mediation	Country of origin, England university city, university, university friendship group, & online community & paranoia	Country of birth: -.16*** English: -.13*** University city: -.11*** University: -.15*** University friends: -.25*** Online: -.08**	Friendship group: $\beta = -.21^{***}$	Significant indirect effect of friendship group ID and paranoia through loneliness (mediator; IE = -0.36, CI[-0.41, -0.31]) Combined ID measures accounted for 7% of variance in paranoia
McIntyre et al, 2021	Parallel moderated mediation	National ID & paranoia	-.13*	Non-significant	Significant negative effect of British identity on paranoia via locus of control at high levels of positive contact and low levels of negative contact ($\beta = .33$, SE .03, CI [-.09, .02]) No significant effect through self-esteem
Prince, 1999	Pearson r correlation	Neighbourhood ID & positive/negative symptoms	Not reported	$r(82) = -.31^{**}$	Psychiatric symptoms, psychosocial functioning, gender and age explained 16% of the variance in psychological integration ($F(4, 77) = 3.74^{**}$)
Sani et al, 2017 Study 1	Multiple regression	Family ID & paranoia	-.23*	$\beta = -.20^*$	
Sani et al, 2017 Study 2	T-tests and cross-lagged path analysis model	Family ID & paranoia	Family T1 & paranoia T1: -.31*** Family T1 & paranoia T2: -.37*** Family T2 & paranoia T1: -.19** Family T2 & paranoia T2: -.24***	Greater family identification T1 predicted lower paranoia T2 $\beta = -.22^{***}$ Mean difference T1 & T2 non-significant for family ID & paranoia Paranoia T1 unrelated to family ID T2 Greater family ID T1 predicted lower anomalous experiences T2 ($\beta = -.14^*$) Greater family ID T2 did not predict lower anomalous experiences T1	
Thomas et al, 2017	Correlation	National ID & paranoia	-.10	Stereotype subscale $r(205) = -.15^{**}$ Other subscales non-significant	English language dominant participants had significantly higher paranoia scores than Arabic dominant participants ($t(206) = -2.70^{***}$, $d = 0.65$) Participants with out-group preference had significantly higher paranoia scores than those with ingroup preferences ($t(206) = 3.04^{***}$, $d = 0.42$)
Velthorst et al, 2012	Correlation	Ethnic & national ID & at-risk mental state	National identity: 0.9 Ethnic identity: -1.0	Ethnic identity: Total psychopathology: $r = -0.69^{***}$ Anhedonia: $r = -0.64^{**}$ Negative symptom: $r = -0.63^{**}$ Alogia: $r = -0.53^*$	

Findings reported of analyses between measure of social identity and psychosis-related experience * $p < .05$ ** $p < .01$ *** $p < .001$

ID = identity

IV = independent variable, DV = dependent variable

AVH = auditory verbal hallucinations

T1 = time point 1, T2 = time point 2

Small social groups: neighbourhood, friendship, and family identity.

The evidence of direct effects with smaller social groups seemed more consistent. There were eight studies that investigated smaller social groups. Almost all reported either direct or indirect associations, however non-significant results were found for university and online community in two studies (McIntyre, Wickham et al, 2018 Study 2; McIntyre, Worsley et al, 2018). The most frequently measured social identity was neighbourhood identity (n = 6). Other social identities investigated were friendship group (n = 2) and family identity (n = 2). Indirect associations through mediators and moderators included financial stress, loneliness, self-esteem, psychiatric symptoms, and psychosocial functioning. Effect sizes were predominately small to medium and all were in the expected direction.

The only study attempting a longitudinal design found greater family identification at time one predicted significantly lower paranoia 7 months later, whilst greater paranoia at time one was unrelated to family identity at the second time point, providing evidence for a cause-and-effect relationship ($\beta = -.22$; Sani et al., 2017). A smaller but significant effect was also found for anomalous experiences ($\beta = -.14$), and this was unexpected by the authors who hypothesised paranoia would have a unique association. This was the case for a study of neighbourhood identity (McIntyre, Wickham, et al. (2018; study 1), who found paranoia had a significant negative association whereas auditory verbal hallucinations did not in a general population, reporting a small effect size ($\beta = -.05$). Prince (1999) however, reported a significant negative association between neighbourhood identity and positive and negative psychotic symptoms in a clinical sample, and this was a medium effect ($\beta = -.31$). A robust study which included the most measures of social identities in this review, found friendship group was the strongest negative predictor of paranoia above other social identities across a university sample, and reported a small effect size ($\beta = -.26$; McIntyre, Wickham, et al., 2018, study 2; McIntyre, Worsley, et al., 2018).

As with larger group social identities, the research explored the mechanisms of the association with mediator and moderate analyses. Self-esteem was found to have a small mediation effect on the relationship between neighbourhood identity and paranoia (Elahi et al., 2018, study 1 & 2; McIntyre, Wickham, et al., 2018, study 1), whereby stronger sense of identity predicted higher self-esteem, associated with

lower levels of paranoia. This was also found for friendship group identity, again reporting small effect sizes (McIntyre, Wickham, et al., 2018, study 2), suggesting this mechanism may be specific to the relationship with smaller groups. One study looked at loneliness as a mediator between friendship group identity and paranoia (McIntyre, Worsley, et al., 2018), showing support for stronger friendship group ties reducing feelings of loneliness, predicting lower levels of paranoia.

Overall, these results seem to indicate distinct categories of social identity have different mechanisms in the effects on psychosis-related experiences, which in turn appear to have varying relationships.

Discussion

This paper conducted a systematic review to investigate what research has found to date exploring social identity in the context of psychosis. It aimed to review how these concepts have been defined and measured, and what the differences may be between various group identities and psychosis-related experiences. The review discovered the research to date has found support for an association between social identity and psychosis, however, this seems to depend on the group and psychosis-related experience investigated, and the nature of these relationships are especially important.

Ethnic identity has not been supported to have a direct effect on paranoia or at-risk symptoms in general population samples, yet there is evidence it has an indirect effect through mediators and moderators. These have included aberrant salience (Cicero & Cohn, 2018), racial discrimination (Anglin et al., 2018), and ethnicity (Gonzales, 2003). Reviewing the effect sizes across studies revealed inconsistent findings both with direct effects and when mediators were included in analyses, with studies reporting small, medium and large effects. National identity has gathered evidence of a direct association with paranoia (Greenaway et al., 2019; McIntyre, Wickham, et al., 2018, study 2), however this has not been replicated (McIntyre et al., 2021; McIntyre, Worsley, et al., 2018). As with ethnic identity, there seems to be an indirect effect of national identity on paranoia through control (Greenaway et al., 2019; McIntyre et al., 2021), contact with the nation's majority ethnic group (McIntyre et al., 2021) and trust (Greenaway et al., 2019). Of note, reported effect sizes were small for direct associations and medium for indirect associations, highlighting the

importance of mediators. The literature has not supported an association between political identity and paranoia (Greenaway et al., 2019).

The review further discovered support for a direct association between friendship group, family and neighbourhood identity and psychosis-related experiences. The direct association with smaller group identities has been more robust than that of larger group identities. These include paranoia (McIntyre, Wickham, et al., 2018; McIntyre, Worsley, et al., 2018; Sani et al., 2017) and anomalous experiences (Sani et al., 2017) in general population samples, and positive and negative psychotic experiences in a clinical sample (Prince, 1999). Self-esteem (McIntyre, Wickham, et al., 2018) and loneliness (McIntyre, Worsley, et al., 2018) have been indicated as mediators in this relationship. All effect sizes included in these smaller group findings were small, with no studies reporting medium or large effects. Interestingly, there were no identified papers exploring sexual, gender or occupational identity and psychosis-related experiences.

The research was robust in operationalising social identity and basing the research question and methodology in theoretical frameworks. This measure captured the multifaceted and changing nature of ethnic identity and brings into question how other social identities are measured within the literature. Factor analysis research has supported a multidimensional three-factor model of social identity including centrality, ingroup affect and ingroup ties (Cameron, 2004; Obst & White, 2005). This counters the construct validity of outcome measures and indicates more exploration of factors involved in social identity.

The majority of papers used general population samples and therefore used appropriate tools to capture psychosis-related experiences. For example, paranoia was the most common experience tested and well supported measures such as the PaDS were used. Few papers used multiple measures to compare differences in associations with social identity, and this limited conclusions of if the association was specific to the experience measured. When papers did use multiple measures, different strengths of associations and significance values were discovered, for instance in Sani et al. (2017). This suggests social identification has varying relationships with different psychosis presentations.

This review provides support for the social identity approach to psychosis. It would suggest the social cure model to health and wellbeing (Jetten et al., 2012) can be applied to psychosis-related experiences within the general population, as there was consistent evidence of stronger social identities predicting lower levels of psychosis. However, findings are not generalisable across all group identities and experiences, and the social cure should not broadly be applied to psychosis. There seems to be specific pathways from certain social identities to the development of psychosis or related experiences, rather than one generic direct association. In comparison to previous reviews on social identity, Postmes et al. (2018) conducted a meta-analysis on 76 studies exploring social identity and depression. An overall negative relationship of a small size was reported. The conclusions drawn from the research mirrored that of the current study; there was substantial variability in associations, and this was dependent on the specific variables measured in each study and the contextual factors.

Strengths and limitations of studies

The quality of the studies in this review were generally good, with most grounding the research questions and methodology in theoretical frameworks. Large sample sizes were used giving good statistical power to analyses. There was ethnic diversity across many of the samples that did report on the ethnicity of participants. A limitation of studies was the use of university students. Whilst 75% did use general population samples, it is well established psychosis exists on a spectrum, with mild symptoms commonly experienced and severe difficulties less seen in clinical populations (van Os et al., 2009). Therefore, general population studies are useful to understand why individuals may be more vulnerable to psychosis and how difficulties may develop. A further limitation is the majority of studies had more female than male participants, with 14 studies reporting their sample was over 50% female, limiting how accurately the findings can be generalised across genders.

Studies were robust in the outcome measures used, with higher quality methodologies using a battery of measures including possible confounds that fit well with the intended variables. This review highlights the use of cross-sectional methodology in the literature, and whilst this is appropriate to address research questions exploring the possibility of an association between social identity and psychosis, further research attempting longitudinal designs would help determine

causality of this relationship. Sani and colleagues (2017) were the only study to attempt this design and the methodology could be replicated on other social identities. This seems more robust than attempting to manipulate social identity (Greenaway et al., 2019), suggesting it may be too firm a construct to manipulate experimentally.

Strengths and limitations of review

A strength of this review is the search strategy; 10 databases including grey area literature were searched and manual searches were conducted on the references of the final papers. Therefore, we can be confident a thorough search was conducted, which identified the relevant papers to include in the review. The initial research question broadly addressed what research has found investigating social identity in the context of psychosis, however this was narrowed in the inclusion and exclusion criteria to include quantitative studies investigating the association between two measures. This allowed a clear definition of social identity to be used and the studies were comparable in their analysis and measurement of each construct. Studies using categorical measurements of social identity or psychosis only would have been difficult to draw conclusions from in relation to the research question. The final studies mostly used linear regression and mediation or moderation analysis, allowing comparison of effect sizes across studies.

Furthermore, during study screening the reviewer judged outcome measures against the social identity definition selected, focusing on categorising oneself as belonging to a group (Turner, 1987) followed by the internalisation of this as part of one's identity (Tajfel, 1986). This excluded a number of studies aiming to measure social identity which were not judged to be relevant for this review. Of particular significance were studies investigating ethnic and cultural identity, where measures such as the Multicultural Identity Integration Scale (MULTIIS; Yampolsky et al., 2016) explore categorisation, compartmentalisation, and integration of multiple cultural identities, however, do not specifically measure the sense of belonging to this group in a way that was comparable to other studies. Acculturation literature proposes a complex process of ethnic identification, which is necessary given an individual may have multiple ethnic identities which interact with their current country of residence and immigration journey (Phinney & Ong, 2007). Thus, there could be scope for a

review exclusively of ethnic identity, regardless of definition, investigating the mechanisms of this association.

Implications of this review

This review has implications for future research. Firstly, cross-sectional research can measure multiple groups with social identity measures and compare the findings across these, for instance using larger and smaller groups. It is also recommended multiple psychosis-related experiences are investigated, including paranoia and schizotypal traits, to explore the variation or similarities between these. It is important findings are not generalised across groups and experiences. The studies excluded from this review due to limited measurement of social identity and psychosis point towards future research ensuring the measures quantify these constructs so findings may be comparable across studies. As discussed, where direct associations have been supported, such as friendship group identity and paranoia (McIntyre, Worsley, et al., 2018), longitudinal methodologies would be pertinent to provide evidence of causality, as implemented by Sani and colleagues (2017). Further replication of mediators and moderators is advised. As the research base grows, there may be substantial enough direct associations between specific social identities and psychosis-related experiences to conduct a meta-analysis. Greenaway and colleagues (2019) conducted a small meta-analysis of the five studies and found a small but significant effect of national identity on paranoia. Finally, research could explore these constructs in clinical samples and compare to non-clinical samples.

In conclusion, this review highlights there is an association between social identity and psychosis, however the strength of this as a direct association appears to be more robust in smaller groups than larger groups, where indirect effects through mediators and moderators seem more important. The findings support the social identity approach to psychosis, whilst highlighting the complexity of these associations and importance of investigating the mechanisms of this relationship.

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An empirical research study examining the association between social identity and paranoia, through the mediators of trust and hostile attribution bias

Abstract

Background and Hypothesis: Paranoia is a common experience prevalent in the general population. To date, there is limited research into the impact of social identity, how we internalise a sense of belonging to a social group, on the formation and maintenance of paranoia. The mechanisms of trust and hostile attribution bias are proposed to be potential mediators of this relationship. The current study aims to investigate the association between specific social identity, family and friendship group identity, and paranoia. It was hypothesised trust and hostile attribution bias would mediate this relationship in a UK general population sample.

Design: This study used a cross-sectional online survey of 355 participants currently residing in the UK who completed measures of family and friendship social identity, trust, hostile attribution bias, paranoia and schizotypy.

Results: A linear regression found social identity significantly predicted paranoia. This was a negative association where high social identity scores predicted lower paranoia scores. A parallel mediation model indicated family and friendship group identity was associated with lower paranoia and lower schizotypy when participants reported higher levels of trust and lower levels of hostile attribution bias.

Conclusions: Social identity is associated with paranoia and schizotypy, and these effects are mediated through trust and hostile attribution bias. The findings have implication for targeting research and interventions on social group membership.

Word count: 9554

Introduction

Paranoia refers to the unfounded belief that other people are trying to cause you harm (Freeman, 2016). Over the past two decades, it has been well established in the literature that paranoid beliefs are not exclusively a symptom of schizophrenia, but a common experience in the general population (Bentall et al., 2001; van Os et al., 2000). In a pioneering study, Freeman and colleagues (2005) surveyed 1202 university students and found paranoia was a common experience, with many people reporting paranoia presenting as regular, mild social evaluative concerns (30-40%). This appeared to advance in a hierarchical structure, with less people displaying persecutory ideation of mild to moderate threat (10-30%) and few people reporting delusional beliefs other people were trying to cause them severe harm (5%). This finding has since been replicated; notably, Bebbington et al. (2013) conducted a similar survey with a sample of 8576 British adults using the Psychosis Screening Questionnaire (PSQ) and found a near identical hierarchy. These studies demonstrate paranoia is a normal, common experience ranging from mistrust and suspiciousness to ideas of reference and, at the severe end, persecutory delusions. Where these experiences cross the threshold to become clinically relevant is classed as a belief that is strongly held, with little evidence and plausibility, and is significantly distressing for the individual (Freeman, 2007). The reframing of paranoia as a normal experience with varying degrees of severity has helped to shift the conceptualisation of psychosis from a “them and us”, stigmatising perspective, to a more normalising and accepting viewpoint (Guloksuz & van Os, 2018).

There is a strong rationale to focus on paranoia specifically above other psychosis-related experiences. Persecutory delusions are the most common type of delusion, with evidence they occur in 70% of patients with first-episode psychosis, and they are more associated with violence above other psychotic symptoms (Ullrich et al., 2018). They are characterised by a severe and deliberating sense of fear, making them arguably the most distressing form of delusion as this is not seen in other delusions such as grandiosity (Sheffield et al., 2021), and paranoia is more strongly associated with social isolation above other psychosis-related experience in the general population (Butter et al., 2017). Thus, understanding the associated mechanisms using general population studies is useful to support clinical interventions (Read et al., 2009).

A multifactorial model of paranoia

One attempt to understand these mechanisms is the cognitive model presented by Freeman and colleagues (2002) of the formation and maintenance of persecutory delusions. This model is underpinned by the stress-vulnerability framework, where the complex interplay between vulnerability and stressful life events, encompassing biological, psychological, and social factors, predisposes individuals to the development of persecutory delusions. These factors interact with beliefs about the self, others and the world, and cognitive biases specifically associated with psychosis. The central feature here is one's search for meaning, where an experience is interpreted in the context of pre-existing vulnerabilities and experiences. The selection of an explanation based on these factors forms the threat belief that someone is out to get you. A strength of this model is how it captures the complexity of potential factors influencing paranoia and attempts to explain the multifaceted mechanisms involved in the development of persecutory delusions. Whilst social factors such as isolation are implicated as mechanisms in this model, the current research argues for a more significant role of social identity.

A social identity approach to paranoia

The common theme across the hierarchy of paranoia is fear and mistrust of other people (Freeman et al., 2005), therefore paranoia can be firmly conceptualised within a social theoretical framework. Whilst attention often focuses on social connection, for instance number of social contacts (Gayer-Anderson & Morgan, 2013), less thought has been given to how individuals connect with the social world through groups (Sani, 2012). The social identity approach integrates both social identity (Tajfel, 1986) and self-categorisation theory (Turner, 1987). Social identity theory proposes people identify themselves not only as an individual "I", but also as a collective "we" and internalise this sense of belonging to their own personal identity. Self-categorisation theory further attempts to explain the factors influencing when people define themselves as a group member rather than an individual. Experimental research has demonstrated the groups we belong to is the ingroup, and others the outgroup, and we assign more trust and personal relevance to those in the ingroup (Hornsey, 2008). Furthermore, the strength of our social identity determines the impact on our emotional and behavioural response (Sani, 2012). Although two individuals may categorise themselves as belonging to the same

group, the degree to which this forms their personal identity will determine how they benefit from said membership (Jetten et al., 2012). It is important these groups foster positive rather than detrimental social experiences to be beneficial (Sani, 2012).

The social identity approach can be applied to the development and maintenance of paranoia. Lacking a sense of belonging to a group could lead to beliefs you are alone, an outsider, and other people are not safe. This framework has roots in evolutionary explanations for human behaviour stating there is a basic, innate drive to form groups to increase chances of survival (Branscombe, 2012). Paranoia is therefore a useful coping strategy; if you do not have a protective group membership, being suspicious and wary of others can influence behaviours to keep yourself safe from harm, such as avoidance and hostility. In terms of the cognitive model of persecutory delusions (Freeman et al., 2002) I suggest poorer social identity is a pre-existing vulnerability. Social identity theory posits most our relationships develop within group contexts, therefore stronger group membership ties will allow more positive and meaningful relationships to develop with members of said group (Sani, 2012). Not having social identity can create barriers to genuine connection, therefore individuals miss out on opportunities to build trusting relationships and be exposed to alternative explanations for events.

A substantial research base has developed supporting the association between a strong sense of social identity and major health benefits, including improved self-esteem and quality of life, decreased cognitive decline and even a longer life span (see Haslam et al., 2012 for a review). Despite this, the literature exploring the association with paranoia appears less developed, however does show support of a relationship. Research investigating small groups such as family, friends, and communities, has so far been promising. Sani (2012), used a longitudinal design to explore cause and effect of family identification on paranoia in a student sample. They found evidence greater family identity predicted lower paranoia over time, however a significant, but smaller, effect was found for anomalous experiences, questioning the specific role in paranoia. A cross-sectional general population study found evidence neighbourhood identity directly affected paranoia, and this finding was non-significant for auditory verbal hallucinations (McIntyre, Worsley, et al., 2018). Furthermore, a robust study measuring six separate social identity groups found friendship group had the strongest significant effect on paranoia within a

university sample (McIntyre, Worsley, et al., 2018). The literature has revealed the important role of mediators and moderators in this association; stronger self-esteem has been supported as a mechanism through which neighbourhood and friendship group identity protects against paranoia (Elahi et al., 2018; McIntyre, Wickham, et al., 2018). Loneliness has also been found to mediate the effect of friendship group identity on paranoia (McIntyre, Wickham, et al., 2018), supporting the suggestion that other social mechanisms are important in the association. This suggests a direct effect of small group social identity and paranoia, however there is inconsistency among findings comparing other psychosis-related experiences.

The evidence supporting direct associations between larger group social identities, such as national, political, and ethnic identity, and paranoia has been less clear-cut. One study investigating older adults found no main effect of ethnic identity on paranoid ideation (Gonzales, 2003), however did find evidence of an indirect effect through ethnicity of participants. The complexity of ethnic identity may make it difficult to find a significant direct effect (Phinney & Ong, 2007). A large study found a small but significant negative effect of national identity on paranoia (Greenaway et al., 2019). Trust and control were found to mediate this effect, with stronger identity predicting lower paranoia when trust and sense of control was high in participants. The same paper reported there was no significant association with political identity, suggesting the type of social group is important. Furthermore, McIntyre and Worsley et al (2018) found country of origin identity was one of two predictors of paranoia in a student sample, with a smaller effect size than friendship group identity. Tentative support is provided by a study on an all-female Emirati college student sample, where national identity was partially associated with paranoia (Thomas et al., 2017). Finally, a general population sample of Black British participants in the UK found no significant direct effect of national identity on paranoia, however there was an indirect effect through locus of control and positive contact with white people (McIntyre et al., 2021). Overall, the evidence base suggests paranoia is influenced by social identity, although the precise mechanisms and specific associations between categories of groups remain somewhat unclear.

Beliefs about others: Trust

The first potential mediator to be explored in the current study is trust. Returning to the cognitive model of persecutory delusions, trust is conceptualised as a belief

about others and the world that mediates the pathways between precipitant and search for meaning (Freeman et al., 2002). Whilst the definition of trust has been heavily debated, it is understood as an expectation other people will do as they say they will and can be relied on (Platow et al., 2012; Rotter, 1971). Trust is central to the concept of paranoia as mistrust of others is, by definition, paranoia (Freeman, 2016). However, I argue paranoia is a presentation of conscious, automatic thoughts other people are out to get you, with accompanying feelings of fear and a lack of sense of safety, whilst trust is a deeper belief about the reliance of other people. It is recognised trust is situation specific, for example our trust in people we know will differ from strangers, and from wider organisations such as the government (Bauer & Freitag, 2017). Building on the model of persecutory delusions, belonging to a social group provides a secure and safe network which fosters positive experiences of trusting others. Social identity theory suggests we internalise these relationships, similar to the emotional maintenance factors in the model of persecutory delusions, thus stable social identity provides beliefs others are trustworthy, and may protect individuals from interpreting events as threats. Conversely, mistrust is implicated as a maintenance factor as it leads to social isolation and less opportunity to discuss paranoid thoughts with others, allowing them to develop without alternative perspectives (Freeman et al., 2002).

The evidence base has so far supported this association. Evidence suggests those with higher levels of paranoia have less trust in other people (Bibbey, 2020), and a direct effect between a bias to mistrust others and paranoia has been demonstrated within a general population sample (Martinez et al., 2021). Wickham et al. (2014) found trust partially mediated the association between neighbourhood deprivation and paranoia along with stress, social support, and discrimination. Furthermore, Freeman et al. (2011) found a significant association between a single item measure of trust (“I trust people around here”) and paranoia in a general population sample. Of relevance, the mentioned Greenaway et al. (2019) study found the effect of national identity, a form of social identity, on paranoia was significantly mediated by trust. The authors suggest belonging to a group forms a foundation for trusting relationships that can protect against paranoia, and this further enhances feelings of personal control which can also buffer against poor mental health outcomes. Consequently, trust is hypothesised to be a mediator in the association between

social identity and paranoia. This fits within the beliefs about others maintenance factor in the cognitive model of persecutory delusions.

Cognitive biases: Hostile attribution bias

The second potential mediator to be explored in this study is hostile attribution bias. Attribution styles refer to how an individual tends to interpret and explain the cause of events (An et al., 2010). Hostile attribution bias is the tendency to interpret other people's actions as hostile (Garety & Freeman, 1999). As with trust, this is argued to be conceptually distinct from paranoia, as a thinking or cognitive style through which someone makes sense of the world, rather than a presentation of specific thoughts and feelings. The Freeman et al. (2002) model proposes an individual develops specific cognitive biases based on past experiences and these inform the selection of explanation. Individuals who develop persecutory delusions are therefore more likely to be biased to interpret neutral events as a threat. This author suggests social identity provides more experiences of interacting with in-group members who are seen to be similar to ourselves and share similar intentions (Scheepers & Ellemers, 2019). Consequently, we attribute other people's actions to external factors rather than hostility, as we would our own (McKay et al., 2005). When an individual has an underdeveloped social identity they have more experience being an outsider and would be more wary of others, making it more likely to attribute other people's actions as hostile.

In a literature review on mostly clinical samples, Buck et al. (2020) reported evidence from 28 studies of a significant relationship between at least one subscale of the Ambiguous Intention Hostility Questionnaire (AIHQ; Combs et al., 2007a) and a measure of paranoia. A small portion of this evidence base also supports the association in general population samples; one sample of undergraduates compared 26 participants with high Paranoia Scale scores to 31 participants with low scores, and found higher paranoia was significantly associated with higher levels of perceived hostility and greater blame on the AIHQ than the low group (Combs et al., 2013). In a larger study, (Combs et al., 2007a) found a greater tendency to blame others was significantly associated with higher paranoia and hostility. The evidence of the association across both clinical and general population samples further supports how similar mechanisms may be present across the hierarchy of paranoia, and this warrants further exploration.

Current research

The association between social identity and paranoia has been supported by a small but promising evidence base emerging in recent years (Sani, 2012), with the mechanisms influencing this relationship requiring further exploration (McIntyre, Wickham, et al., 2018). The current study therefore aims to test the association between social identity and paranoia in a UK general population sample, and to explore the underlying cognitive and psychological mechanisms of trust and hostile attribution bias in mediating this relationship.

The social groups chosen were family and friendship group identity. These were specified due to more robust findings of previous research demonstrating a cause-and-effect association between family identity and paranoia in a general population sample by Sani and colleagues (Sani et al., 2017), and McIntyre, Worsley, et al. (2018) showing friendship group identity demonstrated the strongest significant association compared to five other measures of identity. Capturing both identities also provided opportunity for further exploration of any difference or similarities between groups.

Research has demonstrated different psychological mechanisms in the development of distinct types of delusions, hallucinations and other symptoms occurring in schizophrenia presentations (Sheffield et al., 2021). To test the hypothesis this association is specific to paranoia as explained by the cognitive model of persecutory delusions, a measure of schizotypy was included as an alternative dependent variable. Schizotypy captures the broad range of presentations across the schizophrenia continuum said to be milder precursors of clinical diagnoses (Kwapil & Barrantes-Vidal, 2015), mirroring the hierarchy of paranoia leading to persecutory delusions. The structure of schizotypy has been heavily investigated and debated, with researchers proposing a multidimension construct including unusual experiences, cognitive disorganisation, introvertive anhedonia and compulsive nonconformity (Mason & Claridge, 2006). It therefore seems a useful trait to measure in comparison to paranoia in the current study.

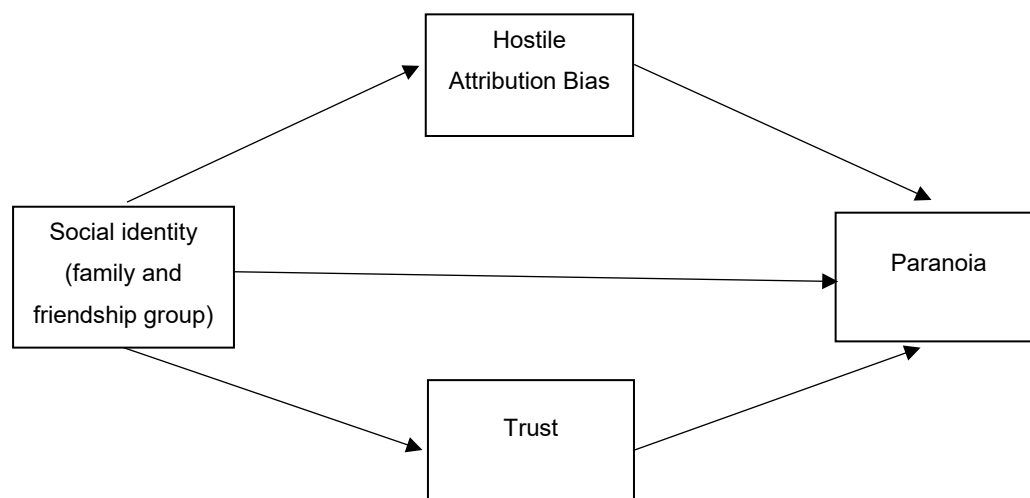
The hypotheses to be tested are as follows:

1. There will be an association between social identity and paranoia. Social identity will have a significant negative direct effect on paranoia, with higher social identity scores predicting lower levels of paranoia and vice versa.
2. There will be an indirect effect of social identity on paranoia through the mediator of hostile attribution bias. Higher social identity scores are expected to predict lower paranoia scores when hostile attribution bias is lower.
3. There will be an indirect effect of social identity on paranoia through the mediator of trust. Higher social identity scores are expected to predict lower paranoia when trust scores are higher.
4. This relationship will be specific to paranoia; there will be either no direct effect or a weaker direct effect of social identity on schizotypy.

The model to test these hypotheses is shown in Figure 1.

Figure 1

The proposed mediation model of social identity and paranoia



Method

Design

This was a cross-sectional study where participants were invited to complete an online questionnaire battery at one time point using Qualtrics online survey software tool (Qualtrics, 2005; Copyright © 2021/22). As this is the first study investigating family and friendship social identity on paranoia through the specific mediators hypothesised, a cross-sectional design is used to test these and inform future

research which may use experimental or longitudinal designs to further test causation. An internet mediated research design was selected to improve chances of capturing a representative general population sample to address the research question. Online surveys yield significant higher response rates than paper surveys due to ease of completion and accessibility to a larger pool of potential participations (Saleh & Bista, 2017). It further allowed a higher level of anonymity than if the researcher collecting data in person, improving the likelihood of participation and more honest reporting.

Ethical approval

Ethical approval was granted by the University of Edinburgh Clinical Psychology Ethics Committee on 25th March 2021. British Psychological Society (2017) ethical guidelines for internet mediated research were considered and followed when designing this study.

Procedure

Participants were recruited through social media channels created for the research project from April to September 2021. Third sector organisations associated with mental health were contacted on social media and via email by the research for assistance advertising the study. The advertised information sheet included an online link to the survey. Potential participants were presented with the full information sheet and consent form. Informed consent was obtained by participants ticking a box stating they understand the information and consent to take part in the study. Further details are available in Appendix B, C and D.

Participants were asked to confirm they were current UK residents and non-residents were automatically withdrawn from the study. The demographic information was collected in the order of age, gender, ethnicity, and education level. This data was collected to analyse possible confounds to the research question. Participants were next asked if they had ever received a diagnosis of a psychosis-related disorder such as schizophrenia, and if they had ever had another mental health difficulty such as anxiety or depression. This data provided information on possible outliers. These questions were optional to minimise the risk of harm if a participant did not feel comfortable providing this information.

Outcome variable measures were presented in the following order: family identity,

friendship group identity, paranoia, hostile attribution bias, trust, schizotypy. This order was selected to prioritise the measures addressing the primary research question to manage the expected attrition rate. Participants were able to withdraw from the study at any point. Participants could not withdraw already completed data as this would require anonymity to be breached to retrieve answers. Partially completed responses were included in the analysis where possible to maximise analysis power.

Participants

Participants were eligible to take part if they were over 18 years of age. An exclusively adult sample was selected as there is evidence demonstrating variation in social identity development in childhood and adolescence (Tanti et al., 2011). As the hierarchical model of paranoia moves away from binary cut-offs between clinical and non-clinical (Bebbington et al., 2013), any current or previous mental health difficulty, including diagnoses of schizophrenia or related psychoses, were included. The study was inclusive of current UK residents to mitigate possible cross-country differences in social identity expression (Brewer & Yuki, 2007). Participants were required to have access to the internet and be physically able to complete the survey. The survey was only available in English therefore participants needed to be able to read English to give informed consent and complete the measures.

An *a priori* statistical power analysis was performed to determine the sample size needed for the mediation analysis using G*Power. Previous studies performing parallel mediation analyses on cross-sectional data for social identity and paranoia report effect sizes of .15 (McIntyre et al., 2021). This is a medium effect size (Cohen, 1988) therefore the power analysis was set accordingly. Alpha was set at =.05 and power at = .80 for 8 predictors, including covariates of age, gender, ethnicity, and education. The estimated sample size was 109 to achieve a medium effect size. This is also sufficient to meet Fritz and MacKinnon (2007) recommended samples size of 78 for a medium effect size.

A total of 401 participants were recruited. Seven participants were excluded as they were not current UK residents. Of the remaining sample, 307 participants completed all data sets and 58 participants partially completed the survey. Ten participants were excluded as they did not complete both the independent and dependent variable

measures therefore could not be included in the analysis testing the primary research question. This gave a total sample size of 355. The attrition rate throughout the survey was 23.69% (n = 95).

Within the sample of 355 participants, the majority identified as female (76.1%), were between 25 and 34 years of age (47.3%), White British (73%) and had an Undergraduate Degree (43.4%). A total of 4.8% of the sample reported having received a diagnosis of schizophrenia or other psychosis related disorder, and 69% indicated having experienced any other mental health difficulty, such as anxiety or depression.

This is higher than the estimated UK prevalence of schizophrenia (0.38%) and all mental health disorders (15.57%; Global Health Data Exchange, 2019). Possible reasons for this elevated rate may be the underreporting in official prevalence rates, asking if participants had a mental health difficulty rather than specific diagnosis, and the targeting of recruitment to mental health related organisations where those who have difficulties may be more interested in related research.

Table 1

Sample Characteristics for all Participants

	N	%
Gender		
Female	270	76.1%
Nonbinary/Agender/Gender Queer	4	1.1%
Male	77	21.7%
Age (years)		
18-24	31	8.7
25-34	168	47.3
35-44	68	19.2
45-54	40	11.3
55-64	39	11.0
65-74	9	2.5
Ethnicity		
Bangladeshi	1	0.3
Black African	3	0.9
Black British	2	0.6
Black Caribbean	2	0.6
Brown British	1	0.3
Indian	2	0.6
Pakistani	1	0.3
Turkish	2	0.6

White British	259	73.0
White European	54	15.2
White Irish	7	2.0
White and Asian	2	0.6
White and Black African	1	0.3
White and Black Caribbean	6	1.6
White European and British	8	2.0
White, Black African and Caribbean	1	0.3
Education		
Primary School	5	1.4
Scottish National 5s, GCSEs, or equivalent	21	5.9
Scottish Highers, A Levels, or equivalent	47	13.2
Undergraduate Degree	154	43.4
Master's Degree	99	27.9
Doctorate Level Degree	27	7.6
Schizophrenia diagnosis		
Yes	17	4.8
No	338	95.2
Mental Health Difficulty		
Yes	245	69.0
No	109	30.7

Note. This table omits number and percentage of participants who declined to answer the relevant question items.

Measures

Social identity. The Group Identification Scale (GIS; Doosje et al., 1995) was included to measure social identity. This is a four-item instrument using a 7-point Likert scale rated from 1 “I strongly disagree” to 7 “I strongly agree”. A higher score indicates a strong social identity. Items measure feelings of belonging “I have a sense of belonging to my [group]” and similarity “I have a lot in common with the members of my [group]”. “Family” and “friendship group” were substituted accordingly. Participants were instructed to rate these based on how best they identify their family and not necessarily their biological family, and the friendship group they spend the most time with. General adult population studies have found good reliability for both family ($\alpha = 0.76$; Sani, 2012) and friendship group ($\alpha = 0.93$; McIntyre, Worsley, et al., 2018). In the current study both scales had excellent reliability (family $\alpha = 0.90$; friendship group $\alpha = 0.93$).

Paranoia. The 18-item Revised Green et al., Paranoid Thoughts Scale (R-GPTS; Freeman et al., 2021) measured paranoia. Items are rated on a five-point Likert scale from 0 “not at all” to 4 “totally” in the last month. It comprises of two subscales:

ideas of reference “People definitely laughed at me behind my back” and ideas of persecution “I was sure someone wanted to hurt me”. Freeman et al. (2021) found excellent reliability both subscales across severity of presentations ($\alpha > 0.90$) and the Cronbach’s alpha for the current study was 0.95.

Hostile attribution bias. The Ambiguous Intentions Hostility Questionnaire, Ambiguous items (AIHQ; Combs et al., 2007) measured hostile attribution bias. This consists of five vignettes of negative social situations where the cause is ambiguous, for example “you are supposed to meet a new friend for lunch at a restaurant but they never show up”. Participants rate a 6 and 5-point Likert scale on how strongly they believe the person performed the action on purpose, how angry it made them feel, and how much they blamed the other person. These form intent, anger, and blame sub scores. Higher scores indicate a high tendency to interpret ambiguous actions as hostile. Two qualitative research rated items were not included as they have poor internal consistency (Buck et al., 2016), are more time-consuming for participants and require more resource to score. The measure has shown good internal consistency in general population samples ($\alpha = 0.86$; Buck et al., 2016). The current study found excellent reliability ($\alpha = 0.90$).

Trust. Trust was measured using Rotter’s Interpersonal Trust Scale (RITS; Rotter, 1967). This is made up of 40 items rated on a 5-point Likert scale from strongly disagree to strongly agree, with higher scores indicating stronger trust. It defines trust as an expectancy that another individual or group can be relied on, and measures both trust of social groups and individuals, and general optimism towards society. The wording was edited to make it more readable, current and UK English, for example “sales men” was changed to “sales person”, and “college” changed to “university”. (Rotter, 1971) found acceptable internal consistency ($\alpha = 0.76$) and this has been replicated in further samples ($\alpha = 0.75$; Schiffman et al., 2010). The current study also found a Cronbach’s alpha of 0.76.

Schizotypy. The sO-LIFE (Mason et al., 2005) is a 43-item measure of Schizotypy for use in general population samples. It includes four subscales related to psychotic experiences: unusual perceptual experiences (e.g. “have you ever thought that you had special, almost magical powers?”), cognitive disorganisation (e.g. “do you often have difficulties controlling your thoughts?”), introvertive anhedonia (e.g. “do you like mixing with people?”) and impulsive nonconformity (e.g. “have you ever felt the urge

to injure yourself?”). These items are rated either 1 “false” or 0 “true”. Mason and colleagues (2005) report excellent concurrent validity ($\alpha > 0.90$) across all subscales. The current study found a Cronbach’s alpha of 0.89.

Analytic plan

Analyses were conducted using SPSS version 24 (IBM Corp, 2016). To test the first hypothesis that there would be a relationship between social identity and paranoia, where higher social identity scores would predict lower paranoia scores, a simple linear regression was performed. This used data from the larger sample size ($n = 355$) who completed both social identity and paranoia measures. The second and third hypothesis was tested using a parallel multiple mediation analysis to establish the extent to which trust and hostile attribution bias mediated the association between social identity and paranoia (Hayes, 2017). This analysis used data from the reduced sample ($n = 307$) who completed all measures using Model 4 of the Hayes (2012) PROCESS extension. This allowed multiple mediators to be tested simultaneously. Finally, to test the fourth hypothesis this relationship was specific to paranoia, a further linear regression was performed substituting schizotypy as the outcome variable to test if social identity scores would predict significant change in schizotypy scores. Preacher and Kelley (2011) recommend measuring effect size in mediation analysis using the unstandardised regression coefficients and R^2 using Cohen (1992) to interpret the strength of an effect size.

Results

Assumptions of normality

A Kolmogorov-Smirnov test explored the distribution of the data. All measures except the RITS were significant and therefore not normally distributed. Further analysis of histograms revealed the GIS measures were both positive skewed, and the R-GPTS and sO-LIFE negatively skewed, as expected with the level of paranoia and schizotypy in the general population (Freeman et al., 2005). Extreme outliers were present for the R-GPTS alone, with 10 participants showing higher-than-average scores, seven of which completed the full dataset. Outliers were included to capture a realistic representation of paranoia in the general population (Freeman et al., 2008). The bias in sampling revealed by these tests was compensated for using

bootstrapping with 1000 samples in the mediation analysis as recommended by Preacher and Hayes (2004).

Missing data

A Missing Values Analysis revealed Little's MCAR test (Little, 1988) was non-significant if $p < .01$ ($X^2(22) = 37.96, p = .02$), indicating the missing data was not ignorable therefore further analyses were performed. Independent t-tests compared demographic data for the group who completed all measures ($n = 307$) compared to those with partially completed datasets ($n = 48$). This revealed a significant difference in education level ($t(355) = -2.77, p < .01$) with those who completed measures having higher level of education on average ($M = 4.20, SE = 1.0$) than those with incomplete datasets ($M = 3.79, SE = 1.12$). To mitigate for these differences as much as possible, linear regressions included all datasets where at least the dependent and independent variables were completed, therefore including full and partially completed datasets, to explore the first and fourth hypotheses. No other demographic variables reached significance. There were no significant differences between groups for any of the outcome measures.

Descriptive data

Table 2 displays the descriptive data and bivariate correlations for all outcome measures. The sample reported a high average for GIS scores (family $M = 5.40$; friends $M = 5.38$) classified as high social identifiers by Doosje et al. (1995). Scores on the R-GPTS were similar to those reported in Freeman et al. (2021) for social reference ($M = 6.77, SD = 5.54$) and persecution ($M = 4.52, SD = 6.74$), well below the clinical cut-off average of 8.75. The average score for the AIHQ was in line with general population samples used in Combs et al. (2007; $M = 3.0, SD = 0.67$) and Buck et al. (2016; $M = 2.42$). Compared to Rotter's (1967), original study, the current sample had comparable average RITS scores ($M = 72.41, SD = 10.90$). Scores on the sO-LIFE were also unremarkable when compared to previous samples with slightly elevated scores on cognitive disorganisation as seen in Mason et al. (4.28 males, 4.44 females; 2005).

All scales and subscales were significantly correlated with each other ($p < .01$). The social reference and persecution subscales of the R-GPS had good reliability (.74). The subscales of the AIHQ also had good reliability between anger and intent (.61),

blame and intent (.66), and anger and blame (.85). The sO-LIFE revealed good reliability between subscales, with introverted anhedonia showing smaller effect sizes than the other subscales. Family and friendship group identification were positively correlated (.37), and negatively correlated to paranoia and schizotypy. Paranoia was highly correlated with schizotypy (.61), with large effect sizes for the unusual experience (.59) and impulsive nonconformity (.53) subscales.

Table 2*Descriptive Data and Bivariate Correlations for Outcome Measures*

Measure	N	Mean (SD)	2	3	4	5	6	7	8	9	10	11	12	13	14	15
GIS	355															
1.Family		5.40 (1.48)	.37*	-.44*	-.38*	-.43*	-.24*	-.29*	-.16*	-.17*	.39*	-.45*	-.32*	-.31*	-.37*	-.42*
2.Friends		5.38 (1.41)	-	-.38*	-.35*	-.36*	-.28*	-.33*	-.19*	-.21*	.26*	-.33*	-.18*	-.24*	-.41*	-.22*
3.R-GPTS	355															
4.Reference		7.36 (7.48)	-	-	.93*	.94*	.49*	.55*	.38*	.38*	-.44*	.61*	.59*	.48*	.36*	.53*
5.Persecution		4.56 (7.98)	-	-	-	.74*	.46*	.52*	.35*	.35*	-.40*	.56*	.52*	.43*	.31*	.49*
6.AIHQ	333															
7.Intent		2.67 (0.79)	-	-	-	-	-	.86*	.90*	.93*	-.41*	.55*	.44*	.47*	.32*	.47*
8.Anger		2.97 (0.96)	-	-	-	-	-	-	.61*	.66*	-.40*	.61*	.47*	.51*	.42*	.50*
9.Blame		2.35 (0.82)	-	-	-	-	-	-	-	.85*	-.33*	.41*	.34*	.37*	.19*	.38*
		2.67 (0.85)	-	-	-	-	-	-	-	-	-.35*	.42*	.35*	.37*	.29*	.37*
10.RITS	310	68.37 (10.28)	-	-	-	-	-	-	-	-	-	-.49*	-.42*	-.39*	-.34*	-.37
11.sO-LIFE	307	3.39 (1.89)	-	-	-	-	-	-	-	-	-	-	.81*	.87*	.62*	.80*
12.UnEx		2.54 (2.19)	-	-	-	-	-	-	-	-	-	-	-	.58*	.32*	.61*
13.CoDi		4.92 (2.92)	-	-	-	-	-	-	-	-	-	-	-	-	.39*	.63*
14.InAn		2.97 (2.31)	-	-	-	-	-	-	-	-	-	-	-	-	-	.29*
15.ImNo		3.16 (2.21)	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Note: SD = Standard Deviation; GIS = Group Identity Scale; R-GPTS = Revised Green's Paranoid Thoughts Scale; AIHQ = Ambiguous Intentions Hostility Questionnaire; RITS = Rotter's Interpersonal Trust Scale; sO-LIFE = Short Oxford-Liverpool Inventory of Feelings and Experiences; sO-LIFE subscales UnEx = unusual experiences, CoDi = cognitive disorganisation, InAn = introvertive anhedonia, ImNo = impulsive nonconformity; Correlations reported are Pearson's r ; * $p < .01$

Hypothesis 1: There will be an association between social identity and paranoia

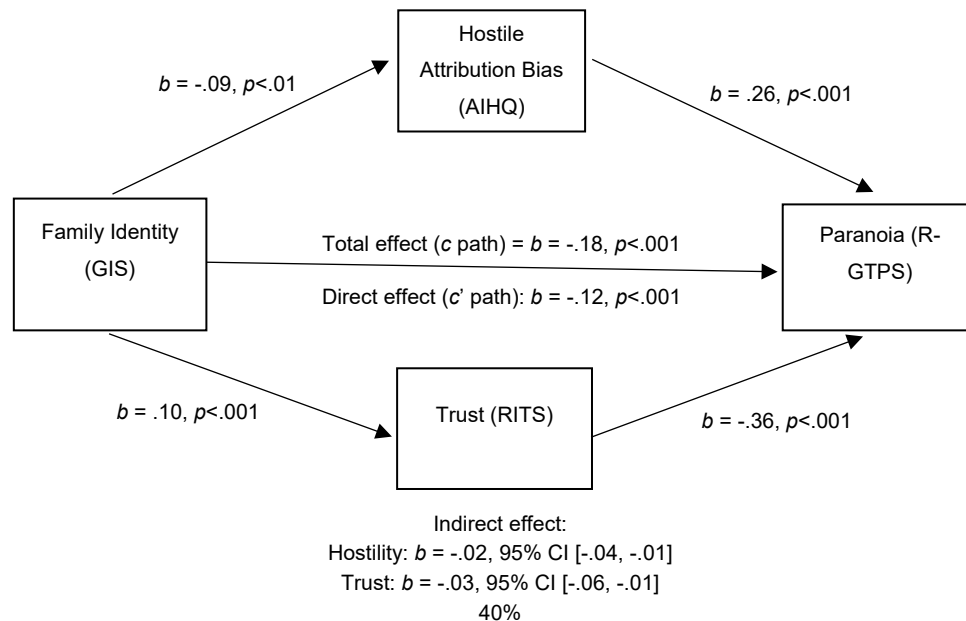
The first hypothesis was tested using a simple linear regression to establish if there is a predictive relationship between social identity and paranoia. Entering family and friendship group identity into this model explained 24.4% of the variation in paranoia scores, a medium to large effect size (Cohen, 1988). The results showed a significant relationship ($p < .001$). For every 1 standard deviation increase on social identity, paranoia scores were predicted to decrease by .18 for family identity and .15 for friendship group identity.

Hypothesis 2 and 3: The relationship is mediated through hostile attribution bias and trust

When controlling for age, gender, ethnicity and education, the mediation analysis showed family identity had a significant effect on paranoia through hostile attribution bias. The indirect path was significant (a path: $b = -.09$, $p < .01$; b path: $b = .26$, $p < .001$). A bias-corrected bootstrap confidence interval for the indirect effect ($b = -.02$) did not contain zero (95% BCa CI [-.04, -.01]). In addition, the mediation analysis showed family identity had a significant effect on paranoia indirectly through trust. The a path between family identity and trust, and b path between trust and paranoia were both found to be significant and in the expected directions (a path: $b = .10$, $p < .001$; b path: $b = -.36$, $p < .001$). A bias-corrected bootstrap confidence interval for the indirect effect ($b = -.03$) did not contain zero (95% BCa CI [-.06, -.01]). The direct effect was significant and smaller than the total effect, indicating the strength of the association between social identity and paranoia was reduced when the mediators were included in the model. This model explained 40% of the variance in direct effect scores, considered a large effect size (Cohen, 1988). Age ($b = -.11$) and education ($b = -.21$) were both found to have significant effects ($p < .001$) in this model.

Figure 2

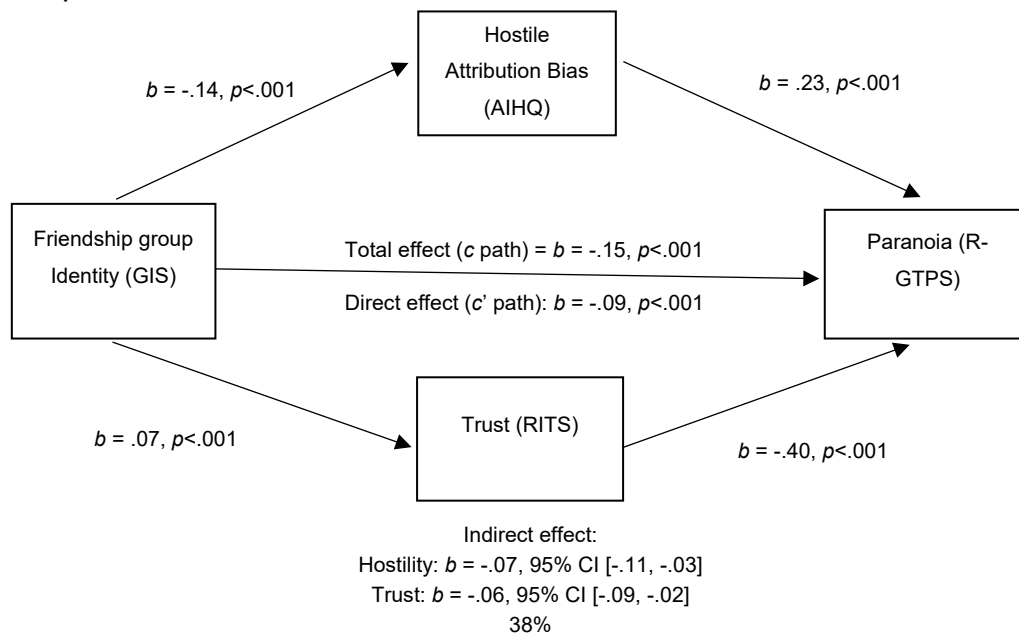
Results of the mediation analysis for family identity, hostile attribution bias, trust, and paranoia



When controlling for age, gender, ethnicity and education, the analysis revealed friendship group identity had a significant effect on paranoia through hostile attribution bias. The indirect effect (ab path) indicated higher friendship group identity was associated with lower paranoia via lower hostile attribution bias (a path: $b = -.14, p < .001$; b path: $b = .23, p < .001$). A bias-corrected bootstrap confidence interval for the indirect effect ($b = -.07$) did not contain zero (95% BCa CI [-.11, -.03]). In addition, the mediation analysis showed higher friendship group identity was associated with lower paranoia when trust was higher (a path: $b = .07, p < .001$; b path: $b = -.40, p < .001$). All effects were therefore in the expected directions. A bias-corrected bootstrap confidence interval for the indirect effect ($b = -.06$) did not contain zero (95% BCa CI [-.09, -.02]). The direct effect of family identity on paranoia through mediators (c' path) was significant ($b = -.09, p < .001$) and smaller than the total effect model (c path) indicating mediation was present in this model. This model explained 38% of the variance in the direct effect. As with family identity, both age ($b = -.10$) and education ($b = -.27$) had significant effects ($p < .001$) in this model.

Figure 3

Results of the mediation analysis for friendship group identity, hostile attribution bias, trust, and paranoia



Hypothesis 4: There will be no effect of social identity on schizotypy

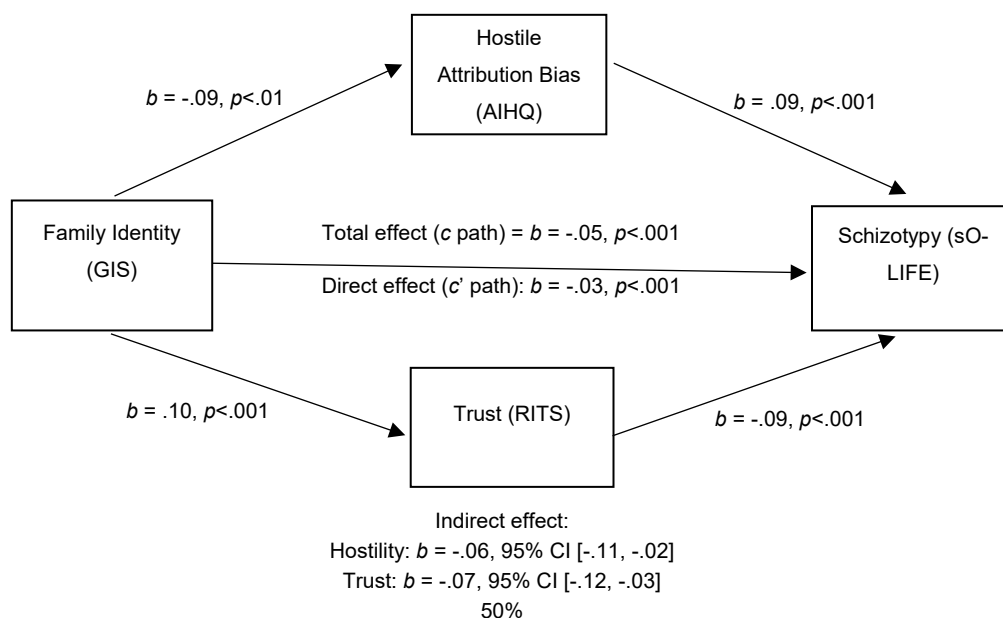
A linear regression analysis was performed to test whether social identity effects schizotypy ($n = 307$). Entering family and friendship group identity into this model explained 23.6% of the variation in schizotypy scores. The results showed a significant relationship ($p = .001$). For every 1 standard deviation increase on social identity, schizotypy scores were predicted to decrease by .49 for family identity and .27 for friendship group identity. These findings support the null hypothesis that the relationship with social identity may not be unique to paranoia and does influence other psychosis-related experiences.

As this analysis found a significant predictive relationship, further exploratory analyses were conducted to test if the same mechanisms influenced the effect of social identity on schizotypy as found with paranoia. The parallel mediation model analysis was replicated substituting schizotypy as the outcome variable with the reduced sample size ($n = 307$). When controlling for age, gender, education and ethnicity, a mediation analysis found family identity had a significant effect on schizotypy through hostile attribution bias and trust. The indirect effects indicated higher levels of family identity was associated with lower schizotypy when hostile attribution bias was lower ($b = .09, p < .001$) and trust was higher ($b = -.09, p < .001$).

A bias-corrected bootstrap confidence interval for the indirect effect of hostile attribution bias ($b = -.06$) did not contain zero (95% BCa CI [-.11, -.02]). This was similarly found for trust ($b = -.07$, 95% BCa CI [-.12, -.03]). The direct effect was smaller than the total effect, indicating mediation occurred in this model. Age and education both had significant interactions with the indirect effect ($b = -.03$, $p < .001$; $b = -.04$, $p < .001$). This model explained 50% of the variance in direct effect scores.

Figure 3

Results of the mediation analysis for friendship group identity, hostile attribution bias, trust, and schizotypy

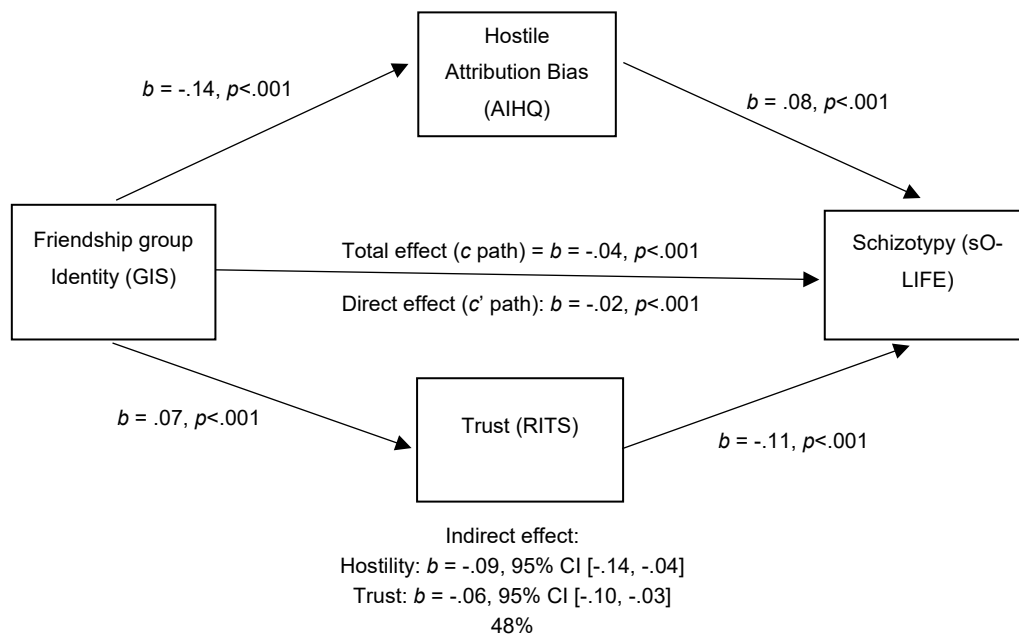


In addition, when friendship group identity was entered as a predictor in this model identity had a significant effect on schizotypy through hostile attribution bias and trust. The indirect path revealed higher friendship identity was associated with lower schizotypy scores when hostile attribution bias was lower ($b = .08$, $p < .001$) and trust was higher ($b = -.11$, $p < .001$). A bias-corrected bootstrap confidence interval for the effect of hostile attribution bias ($b = -.09$) did not contain zero (95% BCa CI [-.14, -.04]). This was similarly found for the effect of trust ($b = -.06$, 95% BCa CI [-.10, -.03]). As with the other models, the total effect size was larger than the direct effect size, indicating mediation took place. This model explained 48% of the variance in

direct effect scores. Again, age and education had a significant interaction ($b = -.03$, $p < .001$; $b = -.04$, $p < .001$), as did gender ($b = .02$, $p < .05$).

Figure 4

Results of the mediation analysis for friendship group identity, hostile attribution bias, trust, and schizotypy



A final exploratory analysis was performed to establish if the direct association was significant for all subscales of schizotypy. A linear regression found significant direct negative effect of family identification ($p < .001$) on all subscales. The analysis found friendship group identification had a significant negative effect for cognitive disorganisation ($p < .01$) and introvertive anhedonia ($p < .001$) only.

Discussion

The present study aimed to test the hypothesis that social identity would be associated with paranoia in a UK general population sample, and this relationship would be mediated by trust and hostile attribution bias. It was predicted a stronger sense of family and friendship group identification would be associated with lower levels of paranoia both directly and indirectly through mediators. It was anticipated this association would be a specific mechanism of paranoia as conceptualised within a social identity framework, and therefore not found for other psychosis-related experiences. To test this, the same model was analysed with schizotypy as the outcome variable.

The linear regression analysis revealed the expected direct association between social identity and paranoia, where a stronger sense of social identity predicted lower levels of paranoia. A mediation analysis found this association was mediated through trust and hostile attribution bias. As anticipated, a stronger social identity was associated with lower levels of paranoia when participants reported higher levels of trust and when they were less likely to attribute other people's actions as hostile. The analysis demonstrated a stronger indirect effect for family identity; however friendship group identity revealed a stronger mediation relationship ($b = -.09$) compared to family identity ($b = -.12$).

Unexpectedly, a linear regression analysis found a negative direct association between social identity and schizotypy. Further mediation analysis revealed this effect was significant through trust and hostile attribution bias. The same directions of effects were seen as paranoia; having a stronger sense of social identity indicated participants showed less schizotypal traits when they reported higher trust and less bias to attribute other's actions as hostile. Of interest, social identity explained more variance in schizotypy than paranoia. Both family and friendship group identity had stronger mediation relationships, where including trust and hostile attribution bias in the model reduced the direct effect to nearly 0 ($b = -.02$ and $-.03$ respectively). Exploratory analyses found friendship group identity did not predict unusual experiences or impulsive nonconformity. These findings are contrary to the hypothesis this association would be specific to paranoia, or that if there was a relationship it would be weaker. It is worth considering the measures for paranoia and schizotypy were significantly correlated in this study, and paranoia may contribute to the sO-LIFE scores.

The findings of this study support the social identity approach to paranoia; having a strong sense of belonging to your family and friendship group appears to provide a buffer to the development of paranoid thoughts. Effect sizes from this study are similar to previous research investigating friendship group identity (McIntyre, Wickham et al, 2018; $-.26$) and family identity (Sani et al., 2017; $-.22$). This supports the proposal that feeling you belong and view yourself as a group member fosters a sense of safety and therefore you are less suspicious of other people (Greenaway et al., 2019). In comparison, lacking this identity, feeling you are an outsider and are not a member of a family or friendship group, seems to lead to the belief you are

alone and wary of others, leading to thoughts people are intentionally trying to cause you harm. Over time, these thoughts may develop and someone lacking group membership could miss opportunity for alternative explanations to be provided (Freeman, 2016). In addition, these findings support the cognitive model of persecutory delusions, which posits a social vulnerability provides a foundation for threat beliefs to form (Freeman et al., 2002). Whilst previous literature has implied other social factors such as quantity of social contacts (Combs et al., 2013) and loneliness (Lim et al., 2018), the present study adds to the emerging evidence base supporting the influence of group membership and how this may be the foundation for further social support to be protective.

It appears this relationship is also evident in schizotypy, particularly for family identity. This contrasts with several previous studies investigating psychosis-related experiences; a study of ethnic identity and attenuated positive psychosis symptoms found non-significant results (Anglin et al., 2018), as did a study into ethnic identity and psychotic-like experiences (Cicero & Cohn, 2018). In addition, McIntyre, Wickham, et al. (2018) investigated the effect of neighbourhood identity on paranoia and auditory verbal hallucinations and found support for paranoia only. The measure of hallucinations however may not be as sensitive as the measure of schizotypy used in the current study to pick up on psychosis-related experiences in a general population sample. Furthermore, previous research has not found an association for hostile attribution bias and psychosis-proneness, whereas this has been found for paranoia (Combs et al., 2013). The current study is however consistent with Sani et al. (2017), who found greater family identity predicted reduced anomalous experiences over time, alongside paranoia. Similar effect sizes are reported for family identity and paranoia, with the current research revealing a total effect of $b = .18$ and Sani et al. (2017) reporting $-.22$. Sani and colleagues reported stronger effects of family identification on anomalous experience, with $-.14$ compared to a total effect of $-.05$ in the current study. This suggests the association may be more prominent in smaller, more personal groups such as family and friends, above other identities.

The association between schizotypy and social identity can be explained by exploring the social aspects of the trait. Impulsive nonconformity is, by definition, anti-social and eccentric behaviour (Mason et al., 2005). Social identity involves

conforming to the behaviours and attitudes of the group (Branscombe, 2012), therefore not having an identity held within a social group could make you score highly on nonconforming behaviours. Individuals scoring high on unusual experiences are more likely to view innocuous stimuli as evidence for delusional beliefs, such as having magical powers (Claridge, 1997), and hearing alternative perspectives from in-group members are more likely to be considered. Cognitive disorganisation taps into aspects of social anxiety and having opportunities to socialise within an important group may protect individuals from this trait. Introverted anhedonia describes a lack of enjoyment from social pleasure and avoidance of intimacy. Lacking social identity could dampen these positive experiences gained from social interactions, or they may feel less familiar and uncomfortable. The results revealed only family identity predicted unusual experiences and impulsive nonconformity, suggesting the association may be heterogeneous and trait specific. This is relevant to the factor analysis research arguing for distinct factors in schizotypy (Vollema & Hoijtink, 2000). It is recommended future research measures a depth and breadth of psychotic-like experiences to explore these associations.

This unexpected finding questions the specificity of social identity's association with paranoia and subsequently the cognitive model proposed in the paper. How paranoia is associated with other schizotypy symptoms and where it fits conceptually is an ongoing research debate (Mason, 2015). In the current study the measure of paranoia and schizotypy were strongly correlated ($r = .61$). This indicates participants who experienced more frequent social evaluative concerns and ideas of reference also exhibit higher levels of schizotypal traits. The cognitive model of persecutory delusions includes the impact of social anxiety and withdrawal, and consequent isolation. Thus, paranoia may lead to schizotypal traits, and it may also be a result of these traits (Cicero & Kerns, 2010). Paranoia and suspiciousness symptoms were previously included as a sub concept of schizotypy, however more recent measures including the O-LIFE have separated these traits (Mason, 2006), with factor analysis studies exploring the conceptual similarities and differences across psychosis-related experiences (Grant et al., 2018). The findings did reveal however that friendship identity was not directly associated with unusual experiences or impulsive nonconformity, indicating there is specificity between factors.

A further question raised by this research is how distinct the association between social identity and psychosis-related experiences is as compared to other mental health difficulties. Reviewing the research of the association between social identity and other mental health difficulties consistently reveals a negative relationship, supporting the hypothesis that having a stronger sense of identity provides protection from psychological difficulties (Haslam et al., 2009). Social identity's role in mental health is broadly less researched than that of physical health (Jetten et al., 2012). The literature examining depression appears to have received the most attention; a meta-analysis conducted by Postmes and colleagues (2018) reported an overall small negative relationship between social identity and depression, however the individual effects sizes were heterogenous. McIntyre, Wickham et al (2018) reported social identify significantly reduced symptoms of paranoia and depression, but not auditory verbal hallucinations, in a community sample. Effect sizes are small to negative, in line with the current study. The issue of specificity may be explained by psychological coping and resilience, perhaps social identity provides protection from psychological difficulties generally. However, the existing literature and current findings would indicate these associations are complex and dependent on contextual factors relating to individual difficulties such as paranoia and schizotypy.

The present study provides specific evidence for the role of family and friendship group identities in paranoia and schizotypy. Whilst the literature exploring larger social group membership, such as national (Thomas et al., 2017), ethnic (Gonzales, 2003) and political (Greenaway et al., 2019) groups, has shown inconsistent findings, the current research build on more consistent evidence supporting family (Sani, 2012) and friendship group (McIntyre, Wickham, et al., 2018) identification. This suggests the type of group is important, and these findings should not be generalised to social identity. It makes sense family identity would be important as it is often the first group we form ties to. This is supported by findings that growing up in institutionalised care increases risk of developing paranoia (Shevlin et al., 2015), and early emotional abuse and neglect predicts the development of schizotypy (Velikonja et al., 2015). Future research could explore other potential mechanisms, such as attachment, which has been supported in showing a role in the development of psychosis (Lavin et al., 2020). Furthermore, our friendship group is often a group

we have specifically chosen ourselves, unlike our national or ethnic group, and may be more likely to have positive and safe group membership.

In addition, this study goes further to provide evidence to why social identity influences paranoia and schizotypy. Trust was a significant mediator in this relationship, which builds on findings from Greenaway et al. (2019) who measured national identity and trust of fellow Americans using a three-item measure adapted from Yamagishi (1986), and suggests this mechanism applies to family and friendship group identity. To my knowledge, this is the first study to evidence a mediating relationship with schizotypy. One small experimental study found high schizotypy scoring participants were significantly less trusting than low scoring participants when someone acted negatively towards them, and this related to elevated trait paranoia (Gilleen & Satkunanathan, 2015), providing provisional evidence of a relationship. The findings support the theory that social identity forms the basis for trust, as being part of a cohesive group is internalised as the expectation other people can be relied on (Foddy et al., 2009). This would make it challenging for someone with low trust to rely on other people's explanation of events, instead selecting more unusual beliefs. It further strengthens the cognitive model of persecutory delusions (Freeman et al., 2002) by proposing our experiences of belonging to social groups forms beliefs other people can be trusted, and this extends outside other group members to wider society, making it less likely we will regard others as suspicious and intending to do us harm when faced with ambiguous scenarios.

The findings also support hostile attribution bias as a mediator. This is consistent with previous research evidencing a tendency to perceive others as hostile is associated with psychosis (Buck et al., 2020; Combs et al., 2007a, 2013). However, previous studies have consistently found a robust relationship with paranoia above other psychosis-related experiences (Buck et al., 2020), making the current findings unexpected. The association also supports the theoretical underpinnings of the cognitive model (Freeman et al., 2002); being part of a group that meets social needs for belonging, acceptance, and safety, provides experiences of other people being non-threatening. This may form a foundation of how we expect other people to be that can generalise to people outside our group. Lacking these in-group experiences could develop into biases influencing how an individual selects an

explanation for an ambiguous event, resulting in the belief another person's intent is hostile and therefore threatening. These mechanisms could also explain the pathway with schizotypy; attributing other's intentions as hostile may make it difficult to learn interpersonal skills and result in difficulties and withdrawal, a key indicator of schizotypy (Debbane et al., 2015).

Strengths and limitations

There are limitations of the current study. Firstly, this study used a cross-sectional design and is limited in inferring causality. It may be that individuals high in paranoia and schizotypal traits, are less likely to form strong social identities. Further research using longitudinal or experimental designs is needed to support causality. Secondly, the sample will be impacted by self-selection bias, as participants interested in the research topic would have been more likely to take part, reducing the generalisability of findings. This may explain the higher than average rate of mental health difficulties and schizophrenia diagnosis reported in the sample, as recruitment was targeted through mental health third sector organisations. The representativeness of the sample cannot be generalised across all populations. It was a majority white female sample with a high level of education and skewed towards the 25-to-34-year age range, affecting the external validity of the findings. It is well established in the literature there are elevated rates of paranoia in ethnic minority populations in the UK and this is particularly elevated for people from African Caribbean backgrounds (Fearon et al., 2006). The association with social identity and paranoia in this population has been specifically explored by McIntyre and colleagues (2021), therefore the lack of ethnic diversity in this study's sample impacts generalisability. Despite these limitations, much of the related literature has been conducted on undergraduate samples (e.g., McIntyre, Worsley, et al., 2018; Sani, 2012; Thomas et al., 2017), therefore this study does add evidence for the findings outside a university-specific sample.

In addition, the attrition rate may have impacted the findings, with 23.69% of the initial sample showing interest in this study dropping out. This was mitigated as much as possible by retaining partially completed responses, prioritising outcome measures relevant to the primary research question in the battery and including data where feasible in analysis. It is possible there were relevant differences of individuals who dropped out of the study before completing any items which may have impacted

the results. Those who completed the study did have a higher level of education on average than those who dropped out during measure completion, although none of the outcome measures showed significant differences. As attending university as an impact on friendship groups and social identity (McIntyre, Worsley, et al., 2018), this may have influenced the findings. Using an internet survey allowed better anonymity than face to face data collection, hopefully reducing the likelihood of social desirability bias, particularly with the stigma associated with psychosis.

Finally, there are limitations to the outcome measure used. Trust as a concept has been widely debated and therefore accurately measuring trust has been challenging (Bauer & Freitag, 2017). Future studies could use multiple measures of trust and compare any differences. Due care should be taken when generalising the findings using the sO-LIFE to other measures of schizotypy, as this concept is widely debated with nuanced definitions of schizotypy and psychosis-proneness (see Grant et al., 2018 for a review of conceptual clarity). Whilst the current research focused on friends and family, given the variability of social identity association with paranoia across the literature it is advisable to use a range of group identities to measure differences. It is possible the order of the outcome measures caused priming effects on participants, whereby the social identity and paranoia measures may have primed these constructs and biased later responses, for example in the schizotypy measure. It was decided not to counterbalance measures as it was expected a proportion of participants would have dropped out during the survey due to factors such as fatigue, therefore the independent and dependent variables were prioritised. Counterbalancing the mediating variables and comparing differences across two groups could have mitigated this limitation and should be considered for future research.

Future directions and implications

Few studies have investigated the social identity approach to psychosis, and this study provides a strong rationale to develop our understanding of how group membership can influence the development and maintenance of paranoia and schizotypy, both directly and through trust and hostile attribution bias. Implications of this study are tentative when applied to clinical populations as the study used a community sample. Whilst considering this limitation, the findings of the current study suggest more research attention could be given to social interventions for people

with or at risk of psychosis-related disorder, particularly where individuals can form meaningful group memberships and create friendships (Harrop et al., 2015).

Professionals who work with people with psychosis in any capacity may consider the mediating factors supported in this study. Focusing on building trusting relationships may potentially help to improve an individual's trust in others over time. Particularly when an individual joins a social group, building trust may be important to focus on initially to gain the full benefits of this intervention. Furthermore, focusing on metacognitive thinking, including hostile attribution bias, by using therapeutic cognitive techniques such as Socratic question may also reduce these biases. These interventions could positively impact the indicated pathways where social identity will be more likely to protect individuals from paranoia and schizotypy. These approaches can also apply to people who are more at risk of developing psychosis and community samples more generally.

Interventions such as community projects and the hearing voices network (Longden et al., 2018) may be indicated as potential focus for research, and studies could investigate if these groups impact individuals' social identity. Furthermore, the importance of family identity indicates future research to potentially explore the role of social identity in family therapy interventions. There is a notable lack of comparable research into the association between social identity and psychosis-related experiences in clinical samples of people who have received diagnoses of schizophrenia or similar disorders.

Summary and conclusion

In conclusion, the present study is the first to explore the role of family and friendship group identity, trust, and hostile attribution bias in the presentation of paranoia in a UK general population sample. Social identity was found to directly and indirectly effect paranoia through mediators of trust and hostile attribution bias, and the same mechanisms were unexpectedly found for schizotypy. It seems having a strong sense of belonging to a close group, either your family or friendships, leads people to have more trust in others and be less likely to attribute people's actions as hostile, providing a buffer from the development of paranoid thoughts and schizotypal traits. This is relevant clinically for people with psychosis and it is recommended services give attention to social interventions where individuals have opportunity to form

meaningful group memberships. It is further suggested clinicians consider what social groups the people they work with belong to and how well developed these social identities are. Further research could replicate these findings in more widely representative populations with longitudinal designs and explore social identity's role in schizotypy.

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Appendix A

QATSDD criteria used in systematic review

	0 = Not at all	1 = Very slightly	2 = Moderately	3 = Complete
1. Explicit theoretical framework	No mention at all.	Reference to broad theoretical basis.	Reference to a specific theoretical basis.	Explicit statement of theoretical framework and/or constructs applied to the research.
2. Clear definition of social identity within explicit theoretical framework	No definition provided	Social identity is mentioned with no attempt to define or provide theoretical underpinnings	A definition of social identity is provided without explicit statement of how it applies to the current research	A clear and explicit definition of social identity is provided with an explanation of the theoretical underpinnings in the context of the current research
3. Statement of aims/objectives in main body of report	No mention at all.	General reference to aim/objective at some point in the report including abstract.	Reference to broad aims/objectives in main body of report	Explicit statement of aims/objectives in main body of report
4. Clear description of research setting	No mention at all.	General description of research area and background, e.g. 'in primary care'.	General description of research problem in the target population, e.g. 'among GPs in primary care'.	Specific description of the research problem and target population in the context of the study, e.g. nurses and doctors from GP practices in the east midlands
5. Evidence of sample size considered in terms of analysis	No mention at all.	Basic explanation for choice of sample size. Evidence that size of the sample has been considered in study design.	Evidence of consideration of sample size to fit general analytic requirements.	Explicit statement of data being gathered to fit exact calculations for analytic requirements.
6. Representative sample of target group of a reasonable size	No statement of target group	Sample is limited but represents some of the target group or representative but very small	Sample is somewhat diverse but not entirely representation e.g. inclusive of all age groups, experience but only one workplace.	Sample includes individuals to represent a cross section of the target population, considering factors such as experience, age and workplace.
7. Description of procedure for data collection	No mention at all.	Very basic and brief outline of data collection procedure, e.g. 'using a questionnaire distributed to staff'	States each stage of data collection procedure but with limited detail, or states some stages in detail but omits others	Detailed description of each stage of the data collection procedure, including when, where and how data were gathered
8. Rationale for choice of data collection tool(s)	No mention at all.	Very limited explanation for choice of data collection tools	Basic explanation of rationale for choice of data collection tools e.g. based on use in a prior similar study	Detailed explanation of rationale for choice of data collection tools e.g. relevance to the study aims and assessments of tool quality statistically e.g. for reliability and validity

9. Detailed recruitment data	No mention at all.	Minimal recruitment data e.g. no. of questionnaires sent and no. returned	Some recruitment information but not complete account of the recruitment process e.g. recruitment figures but no information on strategy used	Complete data regarding no. approached, no. recruited, attrition data where relevant, method of recruitment
10. Statistical assessment of reliability and validity of measurement tool(s)	No mention at all.	Reliability and validity of measurement tools discussed but not statistically assessed	Some attempt to assess reliability and validity of measurement tools but insufficient e.g. attempt to establish test-retest reliability is unsuccessful but no action is taken	Suitable and thorough statistical assessment of reliability and validity of measurement tools with reference to the quality of evidence as a result of the measures used
11. Fit between stated research question and method of data collection	No research question stated	Method of data collection can only address some aspects of the research question	Method of data collection can address the research question but there is a more suitable alternative that could have been used or used in addition	Method of data collection selected is the most suitable approach to attempt to answer the research question
12. Fit between research question and method of analysis	No mention at all.	Method of analysis can only address the research question basically or broadly	Method of analysis can address the research question but there is a more suitable alternative that could have been used or used in addition to offer greater detail	Method of analysis selected is the most suitable approach to attempt to answer the research question in detail
13. Good justification for analytical method selected	No mention at all.	Basic explanation for choice of analytic method	Fairly detailed explanation of choice of analytic method	Detailed explanation for choice of analytic method based on nature of research question
14. Evidence of user involvement in design	No mention at all.	Use of pilot study but no involvement in planning stages of study design	Pilot study with feedback from users informing changes to the design	Explicit consultation with steering group or statement or formal consultation with users in planning of study design
15. Strengths and limitations critically discussed	No mention at all.	Very limited mention of strengths and limitations with omissions of many key issues	Discussion of some of the key strengths and weaknesses of the study but not complete	Discussion of strengths and limitations of all aspects of study including design, measures, procedure, sample and analysis

Appendix B

Advertised information sheet used in recruitment for empirical study

Paranoia and Social Identity Research Study

Participants needed!



THE UNIVERSITY
of EDINBURGH

We are interested in how our relationships with other people can affect how paranoid we are.

Anonymous 15-minute online survey.



Anyone 16+ years & UK based



Questions? Get in touch!
Email Hannah Cooper
h.cooper-5@sms.ed.ac.uk

?

Complete the survey here:
https://edinburgh.eu.qualtrics.com/jfe/form/SV_0dBN6onx6DhpIR7
Or scan the QR code



Paranoia and Social Identity; V3. 26/01/2021

Appendix C

Participant information sheet used in empirical study

Participant Information Sheet

Please take a screenshot for your records or download a PDF here:

Social Identity and Paranoia

Thank you for your interest in taking part in this research on social identity and paranoia. This research study is being led by Hannah Cooper, Trainee Clinical Psychologist, at the University of Edinburgh.

Before you decide to take part it is important you understand why the research is taking place and what it will involve.

Please read the following information carefully.

What is the purpose of this study?

We see ourselves as part of different social groups such as our family, friendship groups, nationality and gender. How we identify ourselves within social groups is important for our wellbeing and can have an impact on the way we see the world. There is some evidence our social identity can affect how paranoid we are in different situations, and this may be linked to how we trust and judge other people. The aim of this study is to explore the relationships between these factors to better understand how they affect each other.

Why have I been invited to take part?

We are looking for people with different experiences and from different backgrounds to take part in this study. We ask that you are 16 years old or over, live in the UK and are fluent in English.

Do I have to take part?

No – it is entirely up to you. If you do decide to take part, please read this information sheet and consent form carefully to understand your rights as a participant.

What will happen if I decide to take part?

On the next page you will read some statements saying you consent to taking part which you will need to agree to. You will then be asked to complete an online

questionnaire which will ask you questions about your friends and family, thoughts about other people and unusual experiences. You are encouraged to complete the questionnaire in a safe environment at a time that is suitable to you. The questionnaire should take around 15-20 minutes to complete.

What are the possible benefits of taking part?

Although there are no direct benefits to taking part, by participating you will be helping the research team to better understand social identity and paranoia.

Are there any possible risks or disadvantages involved?

There are no significant risks of taking part. The survey will ask some personal questions about your friends, family, paranoia, symptoms of psychosis and social situations. Some people may find these upsetting for different reasons and if you find yourself becoming distressed you are encouraged to stop completing the survey and use safe coping strategies you find helpful, such as speaking to someone you trust or distracting yourself. If you are unsure how to get support, these websites might help:

- www.nhsinform.scot/illnesses-and-conditions/mental-health
- www.nhs.uk/conditions/stress-anxiety-depression/
- www.hearing-voices.org/

What if I want to withdraw from the study?

If you do decide to take part you can stop completing the survey at any time, without giving a reason, by clicking the “withdraw” button at the bottom of the page. Your answers will be collected as you press the continue button at the end of each section and it will not be possible to withdraw your answers after you have submitted them. Please note if you close the browser before you have finished the survey your answers will still be saved and used in the research, and if you are using a shared computer other people may be able to see your answers for up to 4 hours.

Will my taking part be kept confidential?

Your data will be processed in accordance with Data Protection Law. All information collected about you will be kept strictly confidential and your data will only be viewed by the research team. The answers you give in this study will be collected by a

survey website called Qualtrics www.qualtrics.com/uk. The website has several measures to make sure your answers are kept private and safe and they are not shared with anybody else.

You will be asked to provide your age, gender and ethnicity in this survey, and you will also be asked about mental health difficulties. This data will be used only to support this research and is confidential. You do not have to disclose this information if you do not want to and this will not affect your participation in the study.

The University of Edinburgh is the sponsor for this study based in the United Kingdom. We will be using information from you in order to undertake this study and will act as the data controller for this study. This means that we are responsible for looking after your information and using it properly. The University of Edinburgh will keep your anonymous data for 5 years after the study has finished.

For general information about how we use your data go to:

www.ed.ac.uk/records-management/privacy-notice-research.

What will happen with the results of this study?

The results of this study may be summarised in published articles, reports and presentations. A summary of the findings will be available in September 2022 and you can request a copy of this by contacting the research supervisor Helen Griffiths at helen.griffiths@ed.ac.uk.

Who has reviewed the study?

The study proposal has been reviewed by Clinical Psychology, University of Edinburgh Ethics Committee.

Who can I contact?

For more information and any questions about the study please contact the lead researcher Hannah Cooper at.

If you would like to discuss this research with someone independent of the study please contact Dr Angus MacBeth, Research Director for the Doctorate in Clinical Psychology, at.

If you wish to make a complaint about the study, please contact the Head of the School of Clinical Psychology, Dr Matthias Schwannauer, at headofschool.health@ed.ac.uk.

If the research project changes in any way, the amended Participant Information Sheet will be shown on this page.

Appendix D

Consent form used in empirical study

Participant Consent Form

Study Title: Social Identity and Paranoia

Researcher: Hannah Cooper, Trainee Clinical Psychologist,

I confirm I have read and understood the Participant Information Sheet (version 4, 16/03/2021) for the above study.

1. I have been given the opportunity to consider the information provided, ask questions and have had these questions answered to my satisfaction.
2. I understand I am taking part voluntarily and can stop participating at any time without giving a reason.
3. I understand that once I have submitted my answers I cannot withdraw from the study
4. I understand my anonymous data will be stored for at least 5 years after the end of the study and may be used for future ethically approved research.
5. I understand that relevant sections of my data collected during the study may be looked at by individuals from the Sponsor (University of Edinburgh), where it is relevant to my taking part in this research. I give permission for these individuals to have access to my data.

Appendix E

Journal author guidelines

This thesis portfolio adhered to the guidelines of Schizophrenia Bulletin: The Journal of Psychoses and Related Disorders

https://academic.oup.com/schizophreniabulletin/pages/Information_For_Authors.