Adolescent Paranoia: The Role of Sense of Belonging, Self-Esteem and Self-Concept Clarity

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Table of Contents

Lay Summary

Empirical Study: 'Adolescent Paranoia: The Role of Sense of Belonging, Self-Esteem and Self-Concept Clarity'

Feeling mistrustful of other people and believing that someone is intentionally trying to harm you is known as paranoia. Paranoia is especially common in adolescence, but little is known about why or how paranoia develops in this developmental period. A lot of what is known about paranoia comes from research with adults and recent research has focussed on understanding how social factors impact it. One social factor is 'sense of belonging', which refers to feeling accepted and important within our social groups. For adolescents, important social groups might include friends, family, or their school. Research in adults has found that feeling a lack of belonging to social groups can make people feel bad about themselves, and this might be the reason why paranoia develops. However, this explanation has not been studied with adolescents yet. Researching this with adolescents is relevant as social relationships are more important in this developmental stage. Also, a key part of adolescence is trying to figure out who they are as a person, which is influenced by social relationships and environments.

Therefore, the aims of this study were:

- To see if belonging (to a range of social groups and specifically within school), self-esteem (i.e., how positively or negatively someone views themselves), self-concept clarity (i.e., how clearly defined and stable over time someone's beliefs about themselves are) and paranoia are linked in adolescence.
- To understand if feeling a lack of belonging leads to low self-esteem and self-concept clarity, which then leads to paranoia. Specifically, we wanted to see if low self-esteem and low self-concept clarity is the middle step that explains why lack of belonging can make adolescents feel paranoid.

Both aims were examined at one point in time and over a period of 8 weeks.

Questionnaires were completed by adolescents aged 13 to 18 years old who were recruited from schools in England. Adolescents completed the same set of questionnaires on three different occasions: time-point 1 (T1), time-point 2 (T2) and time-point 3 (T3). 158 adolescents completed the questionnaires at T1 and 108 completed the questionnaires at all three time-points.

The findings showed that:

- When examined at T1:
    - Higher sense of belonging, self-esteem and self-concept clarity were linked with lower levels of paranoia. Higher belonging was also linked to higher self-esteem and self-concept clarity.
    - Low self-esteem and self-concept clarity did explain why lack of belonging was linked to paranoia.
- When examined over time:
    - Belonging at T1 was not linked to future levels of paranoia.
    - Higher self-esteem at T1 and T2 was only linked to lower levels of paranoia at T2.
    - Higher self-concept clarity at T1 was only linked to lower paranoia at T2.
    - Higher self-concept clarity at T2 was linked to lower paranoia at T2 and T3.
    - Having lower levels of belonging at T1 did not lead to lower self-esteem and self-concept clarity at T2, and this did not then lead to higher levels of paranoia at T3.

This was the first study to look at the connections between sense of belonging, self-esteem, self-concept clarity and paranoia with adolescents. The findings showed that while these factors may be linked at one time-point, they were not associated over time. Specifically, feeling higher sense of belonging did not make adolescents feel better and clearer about who they were as a person, and this was not why they experienced lower levels of paranoia. The lack of findings over time may have been due to the small sample size. Therefore, it is recommended that the study is repeated with a larger sample of adolescents, over a longer period.

A summary of the findings has been sent to the schools that took part so they can share them with their students. Schools have also been offered a talk by the researcher and the findings will be published in a scientific journal.

Systematic Review: 'Can the Cognitive Model of Persecutory Delusions be Applied to Children and Adolescents?'

To understand paranoia, researchers have developed explanations for why it develops and what keeps it going. When testing these explanations in research studies, they have mainly been tested with adults. However, we do not know whether the explanations are the same for adolescents. Therefore, it is important to see if the explanations we have already apply to adolescent paranoia. It is also important that researchers try to develop new explanations specifically for adolescents, as the empirical study aimed to do.

One explanation, which was mainly created to explain adult paranoia, suggests that paranoia develops and is maintained by 6 processes. These include:

1. Feeling worried or anxious
2. Thinking negatively about ourselves
3. Unusual experiences, such as seeing or hearing things that are not there
4. Thinking mistakes that our brains make, for example, making decisions too quickly without having all the facts
5. Behaviours we take to protect ourselves from potential threats, such as avoiding situations
6. Sleep difficulties

Therefore, the aim of this study was to search for and review studies in a systematic way that have looked at the links between paranoia and these 6 processes in children and adolescents. By doing so, we wanted to see if the explanation is relevant to paranoia in young people. Three electronic databases (which are where research studies are stored) were searched to find relevant studies. The studies were only relevant if they examined the links between paranoia and the 6 processes in young people under

the age of 18 years. The results of the studies also had to be quantitative (i.e., numerical) and written in English. In total, 14 studies were found that fit these criteria.

The findings showed:

- Anxiety/worry and thinking negatively about oneself were most important to paranoia in childhood.
- Rather than sleep difficulties directly leading to paranoia, sleep difficulties affected adolescents' mood, which in turn led to paranoia.
- Young people who are paranoid may be more likely to use protective behaviours.
- Unusual experiences and thinking mistakes were not linked to paranoia in young people in the same way that they are in adults.

Overall, the findings showed that most of the processes in the adult explanation can be applied to understanding paranoia in young people. However, 10 out of the 14 studies only looked at associations at one time-point. Therefore, whether the processes cause and maintain paranoia in adolescence is still unclear. To understand this, more research examining how paranoia develops over time is needed.

Both the empirical study and systematic review increased our understanding of paranoia in adolescence, which so far has been an overlooked area of research. Knowing more about what makes paranoia so common in adolescence can help researchers and mental health professionals support young people. Specifically, it may allow professionals to identify young people who are struggling with paranoia and find ways to help adolescents, which may reduce the likelihood of them experiencing more serious or long-term mental health difficulties.

Chapter 1: Empirical Study

‘Adolescent Paranoia: The Role of Sense of Belonging, Self-Esteem and Self-Concept Clarity’

Abstract

Adolescence is a sensitive developmental period marked by personal and social identity formation. The increasing need for social connection and greater likelihood of experiencing social threats, may create the base for paranoid concerns to thrive. A social identity model of paranoia has been proposed in the adult literature and given its developmental significance, requires examination with adolescents. This study aimed to examine whether sense of belonging impacts on adolescent paranoia through indirect effects on self-esteem and self-concept clarity. A school cohort of adolescents aged 13 to 18 years completed self-report measures of sense of belonging, school membership, self-esteem, self-concept clarity and paranoia at baseline and at a 4- and 8-week follow-up. The hypotheses were first tested cross-sectionally using baseline data (n = 158), then longitudinally (n = 108). Cross-sectionally, higher levels of sense of belonging, school membership, self-esteem and self-concept clarity were significantly associated with lower levels of paranoia. While the findings should be interpreted with caution, mediation analysis with the cross-sectional data showed that, when considered independently, both self-esteem and self-concept clarity partially mediated the association between both measures of belonging and paranoia. However, when examined simultaneously, only self-concept clarity emerged as a significant mediator. Longitudinally, baseline sense of belonging and school membership were not associated with future levels of paranoia. Longitudinal mediation demonstrated no statistically significant effects between baseline measures of belonging on 8-week paranoia through 4-week self-esteem and self-concept clarity. The results contribute to the understanding of adolescent paranoia and the developmentally relevant mechanisms that underpin it. Replication in a larger, more diverse sample, over a longer period is required to elucidate temporal pathways. Given the developmental significance, future research should seek to understand how social relationships and social contexts shape adolescent paranoia.

1. Introduction

Paranoia describes excessive mistrust and suspicion of others, and specifically the unfounded belief that others intend to cause one harm (Freeman & Loe, 2023). It exists on a continuum of severity, with most people experiencing transient and low levels of mistrust, and a minority of people experiencing severe and persistent paranoia, such as persecutory delusions (Elahi et al., 2017; Freeman, 2024). Although paranoia is often associated with psychosis-spectrum disorders, it occurs across a range of mental health presentations, as well as in the general population (Bird et al., 2021; Freeman, 2007; Freeman et al., 2019; Wigman et al., 2012). Paranoia is a common experience in adolescence (Freeman et al., 2011), but most of the theoretical understanding and empirical evidence originates from adults. Understanding risk factors for paranoia development during adolescence is essential for guiding early identification, prevention and intervention.

1.1. The Structure of Paranoia

Paranoia has been conceptualised as a hierarchical construct (Freeman et al., 2005). According to this view, persecutory delusions (i.e., strongly held inaccurate threat beliefs that cause distress and impairment to an individual's functioning), are at the top of the hierarchy (see Figure 1). This severe form of paranoia rests on a base of more common fears of rejection and interpersonal worries. For example, negative thoughts about the self which lead to feelings of difference, inferiority, and hence vulnerability. For some, these concerns are further built upon by worries about the intentions of others, and the interpretation of neutral or ambiguous situations as threatening or personal. Greater perceived threat is associated with more distress and becomes progressively less common. Paranoia therefore captures a range of experiences and understanding what causes individuals to move up and down the hierarchy is important across the paranoia continuum.

Figure 1

The Paranoia Hierarchy

Note. From Freeman et al. (2005). Reprinted with permission.

1.2. Adolescence: A Period of Social Vulnerability

Adolescence is a time of significant developmental change, particularly with regards to social, emotional, and cognitive processes (Foulkes & Blakemore, 2018). Mental health difficulties often emerge in adolescence with 48.4% of mental health conditions occurring before 18 years (Solmi et al., 2021). Therefore, it is a sensitive period of development and understanding factors that increase vulnerability to poor mental health is needed to limit the chances of difficulties continuing or worsening in adulthood (Fuhrmann et al., 2015).

An important part of adolescence is the changing relational world. Compared to childhood, adolescents become more autonomous from parents or caregivers, peer relationships become more significant (Delgado et al., 2022), and their social environments become more complex and hierarchical (Steinberg & Morris, 2001). Changes in socialisation, coupled with improvements in social cognition, mean that adolescents become more self-aware, aware of others and responsive to social cues, norms, and expectations (Blakemore, 2012). The enhanced capacity to mentalise also heightens adolescents'

sensitivity to acceptance and rejection by peers (Somerville, 2013; Steinberg & Morris, 2001), which can influence social behaviour and trust in others (Fett et al., 2014).

1.3. Social Identity: Needing to Belong

It is a human need to seek a sense of belonging through social relationships (Maslow, 1943). Social identity and self-categorisation theories (Tajfel & Turner, 1979; Turner et al., 1987) describe how needing to belong drives social identification (i.e., the process of internalising relationships into one's identity and seeing the environment through the lens of the groups one belongs to). Individuals can belong to various groups, including family, friends, ethnic, cultural, and religious groups (McIntyre et al., 2016; Turner et al., 1987), and how strongly one identifies with their groups can affect how they behave towards people inside and outside their groups. These theories postulate that social relationships and contexts contribute to self-concept, including how one thinks and feels about themselves. While positive group associations can enhance self-esteem, negative associations can diminish it (Jetten et al., 2015). This association is reciprocal, whereby having low self-esteem can also make it more challenging to identify with social groups (Harris & Orth, 2020).

Identity formation, including building a coherent and clear sense of self, is important to adolescent development and is shaped by social environments (Erikson, 1968). Belonging to peer groups is important for identity development (Ragelienė, 2016) and strong peer attachment, including factors related to trust, communication, and acceptance, is associated with increased self-esteem (Gorrese & Ruggieri, 2013) and self-concept clarity (Yang et al., 2022). Though social exclusion, bullying and loneliness can negatively impact on adolescent mental health, causing negative outcomes into adulthood (Almeida et al., 2022; El Bouhaddani et al., 2018), supportive home and school environments, as well as peer relationships can protect against long-term consequences (Ttofi et al., 2014).

School is a formative context for influencing identity formation and mental health (Erentaitė et al., 2018; Harrell-Levy & Kerpelman, 2010). Feelings of acceptance, belonging and connectedness by peers

and teachers at school predicts positive outcomes for adolescents, including emotional well-being and academic achievement (Allen et al., 2024; Arslan, 2018; Pate et al., 2017). However, it is also where difficulties with peers and social exclusion most often occur (Arseneault, 2017). As school is where adolescents spend most of their time, understanding sense of school belonging (i.e., feelings of acceptance, respect and inclusion by others at school; Goodenow, 1993), may be beneficial for supporting young people's mental health in general (Allen et al., 2024; Bonell et al., 2019) and paranoia in particular.

Developing positive peer relationships and enhancing sense of belonging in social contexts that matter to adolescents has the potential to improve adolescent mental health, well-being, and self-esteem (Alsarrani et al., 2022; Moltrecht et al., 2024; Spence et al., 2022; Wickramaratne et al., 2022). The protective role that connectedness can have on individuals has been coined the 'social cure' (Haslam et al., 2009; Jetten et al., 2015).

1.4. The Relationship Between Belonging and Paranoia in Adolescence

Paranoia is especially prevalent during adolescence (Freeman et al., 2011). Wigman et al. (2011) found that 89.7% of general population adolescents reported experiencing paranoid thoughts, with 26.4% reporting frequent thoughts. In a large school cohort, Bird et al. (2019) found that adolescents endorsed 7% to 32% of items on a paranoia measure as occurring weekly. Adolescents who reported more uncommon items, such as physical threats of harm, experienced more paranoid thoughts overall. These occurred alongside conspiracy beliefs and more common social concerns. Therefore, there is evidence that is consistent with the paranoia hierarchy existing in adolescence.

As paranoia is a relational experience, based on difficulties trusting others, it is not surprising that it can be triggered by factors related to social connection (Freeman & Loe, 2023; Freeman et al., 2011; Weems & Stickle, 2005). Paranoia has been associated with peer difficulties in adolescence (Bird et al., 2019; Bird et al., 2021) and feeling left out in adulthood (Freeman et al., 2005). Paranoia can also develop in response to difficult social experiences at school, such as bullying and falling out with school

friends (Bird et al., 2022; Harper & Timmons, 2021; Jack & Egan, 2018). Adolescents have described how paranoia made them feel disconnected from others and as though they were outsiders and did not fit in. This caused sadness and frustration and furthered negative thoughts about themselves (Bird et al., 2022). Furthermore, greater identification with positively valued groups is associated with higher self-esteem (Jetten et al., 2015), greater trust (Greenaway et al., 2018), and increased wellbeing (Haslam et al., 2008).

The developmental transitions and challenging social landscapes that are part of adolescence appear to create the base for paranoid concerns to thrive (Bird et al., 2022). It may make sense that paranoid preoccupations are prevalent in adolescence, given they must balance the increasing need for social connection with the greater likelihood of social threat. Mistrust may be an adaptive response to these complexities (Raihani & Bell, 2019). Little is known about why or how paranoid concerns escalate up the hierarchy to more distressing and debilitating threat beliefs, especially in adolescence. Investigating the impact of belonging may be a developmentally relevant area for research.

1.5. Self-Related Mediators: Self-Esteem and Self-Concept Clarity

The relationship between belonging and paranoia, and the mechanisms underpinning this association, is a relatively understudied area. Since changes to the 'self' can occur from lack of belonging (Harris & Orth, 2020; Jetten et al. 2015; Steward et al., 2017), and self-related processes have long been implicated in the development and maintenance of paranoia (Bentall et al., 2001; Freeman et al., 2002; Freeman, 2016), it is plausible that they may underlie this relationship.

Self-esteem refers to how positively or negatively one evaluates themselves (Abdel-Khalek, 2016), whilst self-concept clarity reflects how clear, consistent, and stable self-beliefs are (Campbell et al., 1996). Although they are positively associated (Campbell, 1990; Chen et al., 2022), the relationship between them may not remain stable. Self-determination theory (Deci & Ryan, 1995) postulates that self-concept clarity may not strengthen with more positive self-esteem if an individual's psychological needs are not met, such as needing to belong.

Greater attention has been paid to understanding the relationship between self-esteem and paranoia (Kesting & Lincoln, 2013). Lower self-esteem is associated with higher levels of paranoia across clinical and non-clinical adult populations (Bentall et al., 2008; Humphrey et al., 2021; Murphy et al., 2018). Additionally, Ashford et al. (2012) found that negative self-beliefs mediated the association between childhood bullying and paranoia in undergraduates. Although the literature in adolescents is limited, one large cross-sectional study demonstrated a moderate negative association between mistrust and self-esteem in adolescents (Wong et al., 2014). In a small sample of help-seeking adolescents, poor self-esteem predicted paranoia at 3-months, but the association was no longer significant when baseline paranoia was controlled for, possibly due to limited statistical power (Bird et al., 2017). In general population adolescents, Kingston et al. (2022) found that the relationship between paranoia at baseline and well-being at 6-weeks was mediated by self-esteem, non-judgemental awareness and worry at 2-weeks. Although there is some suggestion that paranoia may lead to changes in self-esteem, more research suggests that self-esteem leads to changes in paranoia (Humphrey et al., 2021). Understanding more about this pathway in adolescence is relevant given that self-esteem decreases from childhood to adolescence (Robins et al., 2002), which may provide the foundation for paranoia emergence.

While global self-esteem is important, studies across the life span show that both level of self-esteem and self-esteem instability are important predictors of paranoia (Raes & Van Gught, 2009; Thewissen et al., 2008). Tiernan et al. (2014) noted that the literature examining self-concept instability is constrained by measuring instability though differences in mean self-concept scores. Therefore, investigating dimensional aspects of self-concept, such as self-concept clarity, may also be important for understanding paranoia (Tiernan et al., 2014). Understanding the role of self-concept clarity may be pertinent for adolescents as they are more likely to have fragmented and confused self-concepts (Diehl & Hay, 2011).

Research to date has overlooked the association between self-concept clarity and paranoia. Relatedly, in adults, self-concept clarity predicted psychotic-like experiences (PLEs), with individuals with low self-concept clarity reporting the highest levels of PLEs (Cicero & Cohn, 2018; Cicero et al., 2015). In adolescents, a cross-sectional association between higher self-concept clarity and greater psychological adjustment and emotion regulation skills has been found (Parise et al., 2019). Additionally, social anxiety, which involves similar concerns about social evaluations to paranoia, was associated with lower self-concept clarity (Kong et al., 2022). Longitudinal studies have found that greater self-concept clarity positively predicted well-being (Xiang et al., 2023) and lowered anxiety and depression (Van Dijk et al., 2014). A bidirectional association was found between self-concept clarity and better-quality relationships with friends and parents (Becht et al., 2017). Individuals with psychosis often report confusion about their identity (Cowan et al., 2021), which has been linked to difficult interpersonal experiences in childhood (Samaey et al., 2023). The confusion that arises following social difficulties may make adolescents more sensitive to perceived threats and rejection, which may give rise to paranoid thinking. However, the association between paranoia and self-concept clarity in adolescence is yet to be investigated.

Self-esteem and self-concept clarity may help to explain the relationship between belonging and paranoia in adolescents. Feeling disconnected may negatively impact on identity formation by changing self-views. It could lead to negative self-evaluations and make it harder to maintain a stable sense of self across different social contexts. This may in turn lead to greater uncertainty when interpreting social interactions and greater possibility of interpreting them as personal or threatening. For some, this may lead to increased suspiciousness about others, which can develop into threat beliefs (Freeman et al., 2002).

1.6. The Proposed Pathway

Based on theory and the available literature, sense of belonging may be associated with paranoia indirectly through the impact on self-esteem and self-concept clarity. Consistent with this view, in

adults, greater identification with participants' neighbourhood significantly predicted lower levels of paranoia, and this association was partially mediated by self-esteem (McIntyre et al., 2018a). Likewise, greater identification with one's country of birth and friendships significantly predicted lower paranoia. Further, the cross-sectional association between friendship identity and paranoia was mediated by self-esteem, which explained 17% of the variance. These findings demonstrate that different social identities are related to paranoia in adults and this relationship may, in part, be explained by self-esteem. However, the cross-sectional nature of the study precludes any causal inferences.

Monsonet et al. (2023) examined the relationship between aspects of social connectedness and paranoia in adults with elevated schizotypy. Cross-sectionally, self-esteem significantly mediated the relationship between poor social support and paranoia, as well as loneliness with social longing and paranoia. No mediation effect was found for loneliness on its own and paranoia, and no association was found between social contact and paranoia. Building on this, they examined these relationships in daily life using Experience Sampling Methodology (ESM) over 7 days. Feeling more socially connected to others decreased momentary paranoia, through improved momentary self-esteem. These findings provide cross-sectional and longitudinal evidence of the protective role that meaningful social connection has on paranoia, and the mediating effect of self-esteem.

Evidence for the proposed pathway in adults is strengthened by experimental findings. In a non-clinical sample, Kesting et al. (2013) induced social stress through criticism and social exclusion using the Cyberball paradigm (i.e., a virtual ball game where balls are thrown between the participant and two other players). In the experimental condition, participants were very rarely thrown the ball, compared to individuals in the control group, and they received negative feedback after completing a task, whereas the control group received neutral feedback. Participants in the experimental condition had significantly higher levels of paranoia than the control group, and self-esteem significantly reduced in response to social stress. Further, increased paranoia occurred due to the reduction in self-esteem,

rather than in direct response to social stress. This provides causal evidence in adults that social exclusion leads to low self-esteem which in turn leads to higher levels of paranoia.

In summary, based off evidence and theory, it could be hypothesised that fostering a strong sense of belonging to social groups leads to higher self-esteem and self-concept clarity which protects against paranoia. Aspects of this pathway have been studied in adults but not with adolescents. One cannot assume that paranoia presents similarly across adolescence and adulthood. Understanding paranoia in this sensitive period by attending to important developmental differences could help to explain the high prevalence of paranoia during this stage (Freeman et al., 2011). Each of the factors proposed are highly relevant to adolescence, given that it is a crucial time for identity formation, and peer relationships become more significant. The school environment shapes personal and social identity formation and is where social trust may develop but social threats may be most likely. The relationships between belonging, self-esteem, self-concept clarity and paranoia require longitudinal investigation with adolescents. Though conclusions cannot be made regarding causation, longitudinal study may further our understanding about how adolescent paranoia develops over time. Investigating adolescent's further down the continuum in the general population can inform methods for supporting young people which may offset risk trajectories for mental health difficulties. Importantly, it may also aid our understanding of paranoia in clinical populations (Freeman, 2007).

1.7. The Present Study

The aims of this study were to examine the association between adolescent sense of belonging and paranoia, and to what extent this relationship can be explained by self-esteem and/or self-concept clarity, in a non-clinical sample of 13- to 18-year-olds.

This study extends previous literature by assessing the prediction of general sense of belonging and school belonging specifically, on paranoia. Further, both self-esteem and self-concept clarity are included as potential mediators. The hypotheses were first tested cross-sectionally with baseline data, then longitudinally across three time-points where sufficient data allowed. The aim of the longitudinal

analysis was to establish temporal pathways to further the understanding of adolescent paranoia development. It is expected that greater sense of belonging at baseline will protect against paranoia 8-weeks later through the impact on self-esteem and self-concept clarity at 4-weeks. The specific hypotheses are summarised below and presented in Figure 2.

Hypothesis 1:

a) Sense of belonging (IV1) and school membership (IV2) will be significantly negatively associated with paranoia (DV) at baseline (T1), and 4- and 8-weeks later (T2 and T3 respectively), when controlling for baseline paranoia.

b) Sense of belonging and school membership will be significantly positively associated with self-esteem (M1) and self-concept clarity (M2) at T1, T2 and T3, when controlling for baseline self-esteem/self-concept clarity.

c) Self-esteem and self-concept clarity will be significantly negatively associated with paranoia at T1, T2 and T3, when controlling for baseline paranoia.

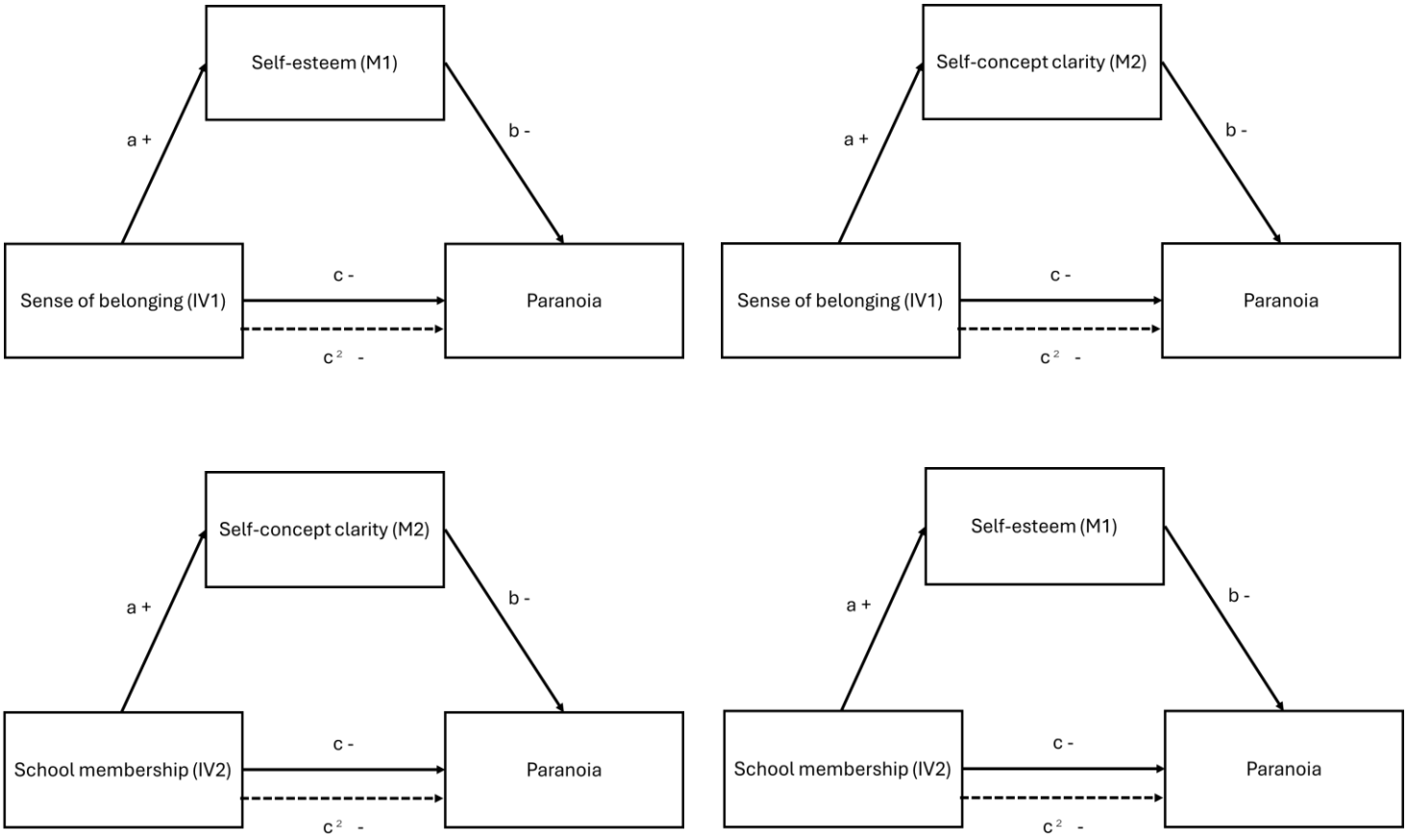
Hypothesis 2:

a) Self-esteem will mediate the relationship between sense of belonging and paranoia, and school membership and paranoia, which will be assessed cross-sectionally and longitudinally.

b) Self-concept clarity will mediate the relationship between sense of belonging and paranoia, and school membership and paranoia, which will be assessed cross-sectionally and longitudinally.

Figure 2

Diagrams of the Hypothesised Pathways Examined



Note. Path a is the prediction of the mediators from the independent variables (IVs); Path b is the prediction of paranoia from the mediators; Path c is the prediction of paranoia from the IVs; Path c^2 is the reduced prediction of paranoia from the IVs due to the mediators.

+ indicates positive associations, - indicates negative associations.

2. Method

2.1. Design

The study was a questionnaire-based study with both cross-sectional and longitudinal data. A mediation design was employed to examine the prediction of paranoia (outcome variable) from sense of belonging (predictor variable 1) and school membership (predictor variable 2), and whether these

relationships were explained by self-esteem (mediator variable 1) and self-concept clarity (mediator variable 2). The study used within-subjects and between-subjects analyses. Participants completed questionnaires at three time points: baseline (T1), 4-weeks after baseline (T2) and 8-weeks after baseline (T3).

2.2. Participants

2.2.1. Power Analysis

To determine sample size, the Software R tool (R Core Team, 2016; Schoemann et al., 2017) was used, which bases estimates on Monte Carlo simulations. Power calculations were estimated to determine the sample size needed to test the indirect effects for Hypotheses 2 (longitudinal mediation analyses), as this was the primary aim of the study. Estimates were made based on McIntyre et al. (2018b) who employed a cross-sectional, simple mediation analysis. Using a 95% confidence interval, to reach 0.8 power or higher at 0.05 significance, the calculation predicted that around 170 participants would be needed to achieve the desired power.

2.2.2. Sample

Inclusion criteria included school attending adolescents aged between 13 and 18 years, living in the United Kingdom (UK) and fluent in English. No exclusion criteria were employed to recruit the necessary sample size and increase generalisability of the findings by ensuring the sample was representative of the adolescent population and paranoia spectrum.

2.2.3. Recruitment

One-hundred and sixty-two participants were recruited from mainstream schools in the UK (see Figure 3). Of these, 113 completed data at all three time-points. Following exclusion of participants, a final sample of 158 adolescents aged 13 to 18 years were included in the cross-sectional analysis and 108 were included in the longitudinal analysis (M = 16.57, SD = 1.18; M = 16.51, SD = 1.13, respectively).

To recruit schools, initial email contact was made with all secondary schools and sixth forms across 18 London Boroughs. Through this strategy, 2 schools were recruited. A further 5 schools were recruited opportunistically through contacts of the researcher and research supervisor. In total, 7 schools agreed to participate which are detailed below.

School 1 (*n* = 39): A state-funded, co-educational school based in a rural village in Surrey. The population is largely affluent and mostly white British.

School 2 (*n* = 4): A state-funded, co-educational sixth form in Newham, London. The school is in an urban area and the population is diverse and multicultural. Recruitment was restricted to Year 12 students.

School 3 (*n* = 19): A state-funded, co-educational secondary school based in Battersea, London. The area is relatively diverse and affluent.

School 4 (*n* = 15): A selective state-funded school in Kingston upon Thames, London. The school is based in a suburban, affluent area with a mostly white British population. The school is single sex (female). Recruitment was restricted to sixth form psychology students.

School 5 (*n* = 26): A state-funded, co-educational school in Bromley, London. The area is suburban and largely white British and affluent. Recruitment was restricted to sixth form students.

School 6 (*n* = 35): An independent, co-educational school in Bedfordshire. The school is in an urban area which is mostly white British. Recruitment was restricted to sixth form students.

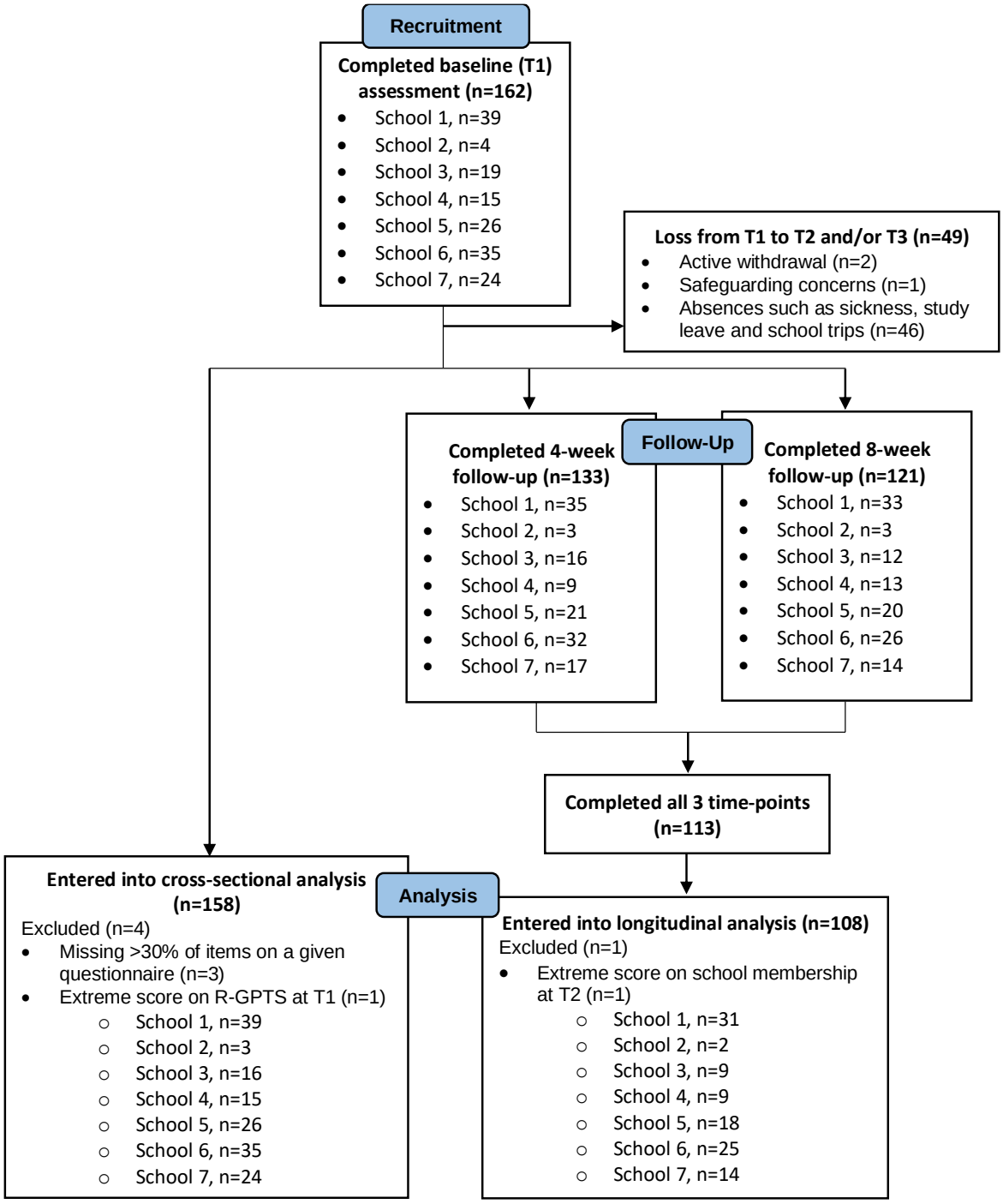
School 7 (*n* = 24): A state-funded, co-educational secondary school in Richmond upon Thames. The school is in a wealthy suburban area where the population is affluent and mostly white British. Recruitment was restricted to sixth form psychology students.

Data were collected between November 2023 and April 2024. To incentivise schools to participate, they were offered a session for their students related to Clinical Psychology, such as a

career talk. Additionally, participants who completed all 3 time-points were entered into a prize draw to win a £25 voucher.

Figure 3.

Participant recruitment and study procedure



2.3. Measures

Participants completed the same set of self-report questionnaires on all 3 occasions (see Appendices A-E). The questionnaires were completed as a group, in a classroom, with the researcher present. Measures were administered in paper format and the order was randomised to minimise potential order effects. The questionnaires took approximately 20 minutes to complete on each occasion. The questionnaires are detailed below.

2.3.1. Sociodemographic Information

At baseline, participants were asked for their age, gender, ethnicity, country of birth, year group, whether they had a diagnosed mental health or neurodevelopmental condition, and socioeconomic status (see Appendix F).

2.3.2. Social Identity

Sense of belonging was measured using the same 3-item scale used by McIntyre et al. (2018a; 2018b). The measure was adapted from Doosje et al.'s (1995) measure of group identification. Participants rated how connected they felt to 7 different social groups on a 7-point scale ranging from 1 (not at all) to 7 (very much). Scores were summed to create a total score for overall sense of belonging. Total scores range from 21 to 147 and higher scores represent greater belonging. The social groups included school, friends, peers at school, village/town/city, online communities, family, and ethnic/cultural group, which were identified as the most important groups to adolescents during participant involvement (see Expert by Experience section below). Participants responded to the same three items for each social group ("I feel a sense of belonging to my…", "I identify with my…" and "I feel strong ties with my…"). The scale has demonstrated good internal consistency in general population samples with adults (Cooper et al., 2023; McIntyre et al., 2018a; McIntyre et al., 2018b). Cronbach's alphas in these studies ranged from 0.87 to 0.93. In the current study, the scale showed good internal consistency, ranging from $\alpha = 0.86$ to 0.92 across time-points.

The 18-item Psychological Sense of School Membership Scale (PSSM; Goodenow, 1993) was used to assess perceived sense of school belonging, including how participants feel in relation to their school, teachers, and peers. Participants rated items on a 5-point scale, ranging from 1 (not at all true) to 5 (completely true). A total score was calculated, with higher scores indicating stronger school belonging. The scale was developed for young people aged 10 years and older and studies evaluating its psychometric properties in adolescent samples have demonstrated that the scale has good construct validity and reliability (α = 0.78 to 0.95; Ye et al., 2013; You et al., 2011). The current study found excellent reliability across time-points (α = 0.88 to 0.91).

2.3.3. Paranoia

Paranoia was measured with the 10-item Revised Green et al. Paranoid Thoughts Scale (R-GPTS), persecution subscale (Part B; Freeman et al., 2019). The scale was developed to assess paranoia across the continuum, including both clinical and non-clinical populations. The persecution subscale was used as it captures persecutory ideation specifically (e.g., "People have been hostile towards me on purpose"). Respondents were asked to rate the extent of their thoughts and feelings in the last month on a 5-point scale from 0 (not at all) to 4 (totally). Total scores range from 0 to 40 and can be categorised into thresholds that correspond to clinical cutoffs: 'average' (0-5), 'elevated' (6-10), 'moderately severe' (11-17), 'severe' (18-27) and 'very severe' (≥28). Scores of more than 11 indicate clinically significant levels of persecutory ideation and scores of 18 or more indicate likely persecutory delusion (Freeman et al., 2019).

The R-GPTS has been recommended as the most reliable and valid self-report measure of paranoia (Statham et al., 2019). The persecution subscale has shown excellent psychometric properties for general population adolescents, including high internal consistency (Cronbachs α = 0.96) and high convergent validity (*r* = 0.60-0.75) with subscales from a similar construct, The Bird Checklist of Adolescent Paranoia (B-CAP; Bird et al., 2020). Low discriminant validity was found between measures of distress and bullying, but the R-GPTS performed better than the B-CAP (Schlier et al., 2024). In the

current sample, the RGPTS persecution scale showed excellent internal consistency with Cronbach's α ranging from 0.90 to 0.94 across time-points.

2.3.4. Self-Esteem

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965), is a measure of global self-esteem, assessing positive and negative feelings about the self. It is a 10-item measure, rated on a 4-point scale, ranging from 1 (strongly disagree) to 4 (strongly agree). Total scores range from 10 to 40. Higher scores reflect higher self-esteem. The measure has been widely used, including in adolescent populations (Kingston et al., 2022; Raes & Van Gucht, 2009; Rosenberg et al., 1989). Studies have evidenced unidimensional construct validity and high convergent validity with measures of overall health (Gnambs et al., 2018; McKay et al., 2014). For a non-clinical sample of adolescents, the scale showed excellent internal consistency (α = 0.90) and good retest-reliability (r = 0.83, r = 0.79 at two- and six-week follow-up respectively; Kingston et al., 2022). The current study found Cronbach's alphas between 0.85 and 0.90 across time-points.

2.3.5. Self-Concept Clarity

The Self-Concept Clarity (SCC; Campbell et al., 1996) scale assesses the extent to which self-beliefs are clearly, confidently and consistently defined, and are stable over time. The scale comprises 12-items that are rated from 1 (strongly disagree) to 5 (strongly agree). Total scores range from 12 to 60 with higher scores indicating stronger self-concept clarity. Assessment of its psychometric properties indicate that it is a reliable and valid tool, including construct validity and convergent validity with a measure of fear of negative evaluation by others (Glezakis et al., 2024). In adolescent samples, good test-retest reliability has been found (Wu et al., 2010), as well as excellent internal consistency with Cronbach's alphas ranging from 0.81 to 0.86 (Kong et al., 2022; Xiang et al., 2023). The Cronbach's alpha was between 0.89 and 0.91 in this sample.

2.4. Expert by Experience Involvement

A group of 9 adolescents were consulted when designing the study. The group provided feedback on the aims, where they shared that research looking into the role of belonging was important to them. They also reviewed all study materials, including information sheets, consent forms, questionnaires, and debriefing information (see Appendices G-K). They gave feedback on the accessibility and acceptability of the documents. The forms were adapted in response to their feedback, whilst maintaining ethical standards. For example, the adolescent information sheet was re-designed to be more engaging, wording was made simpler, and text was shortened. Following revision, two of the young people reviewed the documents again and confirmed the changes. These young people were also consulted with to identify social groups to include in the Sense of Belonging scale.

2.5. Ethical Considerations

The Royal Holloway Ethics Committee granted ethical approval on 3rd May 2023 (see Appendix L). The research was conducted in-line with guidance on research with children and adolescents (Shaw et al., 2011).

It was not anticipated that the study would pose significant risk or harm to participants. However, as questionnaires contained some potentially distressing questions, the study adopted an opt-in consent procedure. There were three levels of consent needed. First, the Head Teacher provided written consent for the research to take place at their school. Then, while all parents/carers received written information about the study, only parental consent was required for adolescents under 16 years. Lastly, all adolescents were given information about the study prior to testing so they could consider whether they wanted to participate, and they provided written informed consent at baseline.

Prior to testing, each school was consulted with to obtain their safeguarding procedures, should a participant become distressed at any point. The researcher and a teacher remained present during sessions to provide instruction and answer any questions. Participants were signposted to services to access support, should they need to, on the information sheet and debrief. At baseline,

there were concerns about one student's well-being. The researcher discussed the concerns with the research supervisor and passed on the concerns to the students' teacher.

To protect participants identity, names were not written on any questionnaires. Participants had a unique identification number which allowed the researcher to link their questionnaires at all time-points. Participants were informed about their right to withdraw, and they did not need to give a reason for withdrawing. All participants were provided with debriefing information.

2.6. Analyses Strategy

All analyses were computed using SPSS Version: 28.0.1.1 (15). Prior to analysis, missing data were analysed, and missing values were imputed. Outliers were explored by examining box blots and data was checked for normality through calculating z scores for skewness and kurtosis. As one variable was significantly skewed (R-GPTS at T1), bootstrapping with 1000 samples and a 95% confidence interval (CI) level was used where relevant in the analyses to minimise potential bias (Preacher & Hayes, 2004). CIs that did not cross zero were deemed significant. Therefore, there was no need to transform any variables. To meet the assumptions for mediation, linearity, homoscedasticity and multicollinearity were also examined.

Descriptive analysis was used to present the sample characteristics and key variables across samples and time-points. Next, independent t-tests and chi-square tests were used to examine any sociodemographic differences between those who completed the measures at all three time-points versus those who did not. Repeated measures ANOVAs and paired t-tests were conducted on the longitudinal sample to test differences between the variables means at T1, T2 and T3, and to assess any significant changes over time.

To test Hypothesis 1, Pearson's *r* correlations were conducted to assess bivariate associations between all variables. To examine associations between the predictor variables (sense of belonging and school membership) and mediator variables (self-esteem and self-concept clarity) and paranoia over time, bivariate and partial Pearson's *r* correlations were conducted with the longitudinal sample.

For partial correlations, each predictor variable at T1 and mediator variable at T1 and T2 were entered with T2 and T3 paranoia as the dependent variable, whilst controlling for baseline levels.

To tests Hypothesis 2, mediation was tested using model 4 from the PROCESS Macro version 4.2 (Hayes, 2022). Bootstrapping with 5000 samples and 95% CI and the HC4 (Cribari-Neto, 2004) heteroskedasticity-consistent estimator were used for all mediation models.

Initially, four independent models were tested cross-sectionally using baseline variables to examine the effect of: 1) sense of belonging on paranoia, via self-esteem, 2) sense of belonging on paranoia, via self-concept clarity, 3) school membership on paranoia, via self-esteem, 4) school membership on paranoia, via self-concept clarity. Self-esteem and self-concept clarity were then entered into a parallel mediation model to investigate whether they carry significant unique mediation effects while controlling for the shared variance with one another.

Finally, mediation was tested longitudinally to examine the effect of 1) baseline sense of belonging on T3 paranoia, via T2 self-esteem, 2) baseline sense of belonging on T3 paranoia, via T2 self-concept clarity, 3) baseline school membership on T3 paranoia, via T2 self-esteem, 2) baseline school membership on T3 paranoia, via T2 self-concept clarity. Baseline paranoia and self-esteem/self-concept clarity were controlled for, as recommended for longitudinal mediation (Loh & Ren, 2023).

3. Results

3.1. Assumption Testing

3.1.1 Missing Data

Overall, 162 participants completed baseline data, 133 completed T2 data, 121 completed T3 data, and 113 completed data at all three time-points. Reasons for loss between time-points are shown above in Figure 3. Instead of using multiple imputation to replace missing questionnaire data, the full T1 data was used for testing the cross-sectional hypotheses and complete cases (i.e., those with data at all three time-points) were used for longitudinal analysis. Research suggests that this is the most

efficient method in this case, and using multiple imputation for longitudinal data can introduce bias (Hughes et al., 2019).

Missing data were rare. For cross-sectional data, 0.46% of all values were missing and for longitudinal data, 0.18% were missing. Item-level missing data were examined to determine missing data mechanisms. Items were deemed to be missing completely at random and missing at random. For example, due to skipping questions, non-applicability or not understanding the question. For item-level missingness, missing values were imputed using mean substitution. However, participants who missed >30% of items on a given questionnaire were excluded (n = 3).

3.1.2. Outliers

Field (2017) recommends that extreme outliers are those that fall 3 standard deviations (SD) above or below the group mean. One participant was excluded from the analysis due to showing an extreme score on the R-GPTS at baseline. One complete case demonstrated an extreme score on the PSSM at T2. Therefore, they were excluded from the longitudinal analysis, meaning only their baseline data was used for the cross-sectional analysis. Following exclusion of participants, a final sample of N = 158 participants were included in the cross-sectional statistical analysis and n = 108 were entered for longitudinal statistical analysis.

3.1.3. Normality

Normality was assessed at each time point, for each variable, using either the full cross-sectional sample for T1 distribution and the complete sample for T2 and T3 variables. Scores were considered non-normal if the z score was above 2.58 (p > 0.01) (Field, 2017). In the cross-sectional sample, baseline paranoia scores (R-GPTS at T1) were significantly positively skewed (z = 3.57, p < 0.01). All other variables were normally distributed. To minimise potential bias from non-normality bootstrapping with 1000 samples and a 95% CI level was used for subsequent analyses.

3.1.4. Linearity and Homoscedasticity

To examine linearity, histograms and normal P-P plots of standardised residuals were analysed. For the cross-sectional analysis, residuals were approximately normally distributed, with residuals falling near to the line on the P-P plots. The longitudinal analysis showed that residuals fell close to the line on P-P plots, but the histogram showed a potential positive skew and platykurtic distribution. The scatterplots of standardised residuals were examined to assess homoscedasticity and it was unclear from the spread of scores as to whether the data met the assumptions of homogeneity of variance. To account for potential non-normality of residuals and homoscedasticity, bootstrapping and a heteroscedasticity model were used for mediation analysis to limit possible bias (Field, 2017).

3.1.5. Multicollinearity

Correlations between variables are described below and presented in Table 3. Although correlations between T2 self-esteem and T2 self-concept clarity (r = 0.71), T3 self-esteem and T2 self-concept clarity (r = 0.71), and T3 self-esteem and T3 self-concept clarity (r = 0.72) were large, no variables demonstrated high levels of multicollinearity (i.e., $r \geq 0.80$; Field, 2017). Linear regression models were also used to assess the Variance Inflation Factors (VIF). Cross-sectionally, all baseline measures demonstrated VIFs ranging from 1.54 to 2.26 and the Durbin-Watson value was 1.94. For longitudinal data, VIFs ranged from 1.65 to 2.38 and the Dubin-Watson value was 1.89. This showed that although the variables are moderately correlated, no critical levels of multicollinearity were observed (Field, 2017). As residuals were uncorrelated the data met the assumption of independent errors.

3.2. Participant Characteristics

The sample characteristics are displayed in Table 1. The overall sample was predominantly female (n = 90). There were 62 males (39.2%), 3 trans males (1.9%) and 1 gender queer participant (1.9%). Most participants were white British and born in the UK. Approximately a quarter of the sample reported having a diagnosed mental health or neurodevelopmental disorder, with most participants

reporting more than one diagnosis. The most common diagnoses were anxiety disorders and neurodevelopmental disorders. Most participants reported being of a similar socioeconomic status to their peers.

3.2.1. Sample Differences

Independent t-tests and chi-square tests were used to explore whether there were any significant sociodemographic differences between participants who completed all three time-points versus those who did not complete T2 and/or T3 measures. No significant differences between complete (n = 108) and incomplete cases (n = 50) were found in terms of age, school attended, gender, ethnicity, mental health condition or baseline paranoia severity. However, significant differences were found for socioeconomic status ($\chi^2(3) = 8.09$, $p = 0.04$), which indicated that participants with complete data were less likely to report being similar to their peers and more likely to report being unsure or of a lower socioeconomic status. The proportion of participants who reported being richer than their peers was similar between complete and incomplete cases.

Table 1.

Demographic data

Characteristic	Cross-sectional sample (*n* = 158)	Longitudinal sample (*n* = 108)
Age; M (SD)	16.57 (1.18)	16.51 (1.13)
Gender	57% female	58.3% female
School		
1	24.7%	28.7%
2	1.9%	1.9%
3	10.1%	8.3%
4	9.5%	8.3%
5	16.5%	16.7%
6	22.2%	23.1%
7	15.2%	13.0%
Ethnicity		
White	67.7%	68.5%
Asian	12.0%	11.1%
Mixed/Multiple	9.5%	10.2%
Other	6.3%	6.5%
Black	3.8%	3.7%
Prefer not to say	0.6%	
Country of birth		
UK born	79.7%	78.7%
Non-UK born	20.3%	21.3%
Mental health diagnosis	25.3%	22.2%
Socioeconomic status		
Richer than peers	13.9%	13.9%
Poorer than peers	16.5%	18.5%
Similar to peers	53.8%	47.2%
Don’t know	15.8%	20.4%

3.3. Descriptive Statistics

Table 2 provides descriptive data for study variables. Paranoia scores ranged from 0 to 37 and the mean severity of self-report paranoia was within the moderate range in both samples (M range = 11.04 to 11.83). Given that a score of >11 is indicative of clinical levels of persecutory ideation (Freeman et al., 2019), this suggests that the group mean was just at this cut-off. Categorising participants according to the R-GPTS cut-offs, across the full sample, 36.71% scored in the average range, 20.25% scored in the elevated range, 18.99% scored in the moderate range, 17.09% scored in the severe range and 6.96% scored in the very severe range.

3.3.1. Changes Over Time

Repeated measures ANOVAs were used to test whether there were any significant differences between mean scores at T1, T2 and T3. There were no significant differences in mean scores for paranoia ($F(2,216) = 0.24$, $p = 0.79$), sense of belonging ($F(2,218) = 0.22$, $p = 0.12$), school membership ($F(2,216) = 1.33$, $p = 0.27$) or self-concept clarity ($F(2,216) = 2.71$, $p = 0.07$). However, there were significant differences on scores of self-esteem at T1, T2 and T3 ($F(2,218) = 3.41$, $p = 0.04$). Paired t-tests showed that the difference in scores occurred because mean self-esteem scores significantly increased from T1 to T3 (M difference = 0.71, 95% CI [0.13, 1.31]), ($t(109) = 2.40$, $p = 0.02$). Mean scores of the key variables across time-points are shown in Table 2.

Table 2.

Descriptive statistics

Variables	Cross-sectional sample (*n* = 158)		Longitudinal sample (*n* = 108)	
	Mean	SD	Mean	SD
Paranoia T1	11.04	9.17	11.41	9.09
Paranoia T2			11.83	9.54
Paranoia T3			11.67	9.55
Belonging T1	97.36	17.75	98.23	18.59
Belonging T2			96.17	19.90
Belonging T3			95.87	20.69
School membership T1	62.59	11.55	63.36	11.43
School membership T2			62.63	11.18
School membership T3			62.32	11.33
Self-esteem T1	26.53	5.28	26.72	5.47
Self-esteem T2			27.23	5.74
Self-esteem T3			27.43	5.78
Self-concept clarity T1	32.67	10.12	33.08	10.47
Self-concept clarity T2			33.88	10.67
Self-concept clarity T3			34.42	10.44

Note. T1 = baseline measurement, T2 = 4-week follow-up, T3 = 8-week follow-up.

3.4. Hypothesis 1

Cross-sectionally (n = 158), bivariate correlations showed that sense of belonging (r = -0.31, p < 0.001, BCa 95% CI [-0.46, -0.16]) and school membership (r = -0.50, p < 0.001, BCa 95% CI [-0.63, -0.36]) were significantly negatively associated with paranoia, with medium to large effect sizes, respectively. Self-esteem was significantly positively associated with sense of belonging (r = 0.36, p < 0.001, BCa 95% CI [0.22, 0.49]) and school membership (r = -0.55, p < 0.001, BCa 95% CI [0.42, 0.65]), with medium to large effect sizes. Self-concept clarity was significantly positively associated with sense of belonging (r = 0.24, p = 0.001, BCa 95% CI [0.08, 0.38]), with a small effect size, and school membership (r = 0.39, p < 0.001, BCa 95% CI [0.24, 0.54]), with a medium effect size. Additionally, paranoia was significantly negatively associated with self-esteem (r = -0.42, p < 0.001, BCa 95% CI [-0.55, -0.28]) and self-concept clarity (r = -0.42, p < 0.001, BCa 95% CI [-0.53, -0.29]), both with medium effect sizes.

Longitudinally (n = 108), bivariate and partial correlations between the hypothesised predictor variables and mediator variables and baseline, 4-week and 8-week paranoia are presented in Table 3. In the partial correlations, baseline paranoia or baseline self-esteem/self-concept clarity were controlled for. Baseline sense of belonging and baseline paranoia were significantly negatively associated, with a medium effect size. However, baseline sense of belonging and paranoia at 4- and 8-week follow-up were not significantly associated, after controlling for baseline paranoia. Additionally, although baseline school membership and baseline paranoia were significant negatively associated, with a large effect size, baseline school membership and paranoia at 4- and 8-week follow-up were not significantly associated, after controlling for baseline paranoia.

A significant positive association was found between baseline sense of belonging and baseline self-esteem (r = 0.38, p < 0.001, BCa 95% CI [0.20, 0.53]), with a medium effect size. However, baseline sense of belonging was not significantly associated with self-esteem at 4-weeks (r = -0.05, p = 0.299, BCa 95% CI [-0.24, 0.16]) or 8-weeks (r = 0.10, p = 0.144, BCa 95% CI [-0.12, 0.32]), after controlling for

baseline self-esteem. Likewise, although baseline school membership was significantly positively associated with baseline self-esteem (r = 0.54, p < 0.001, BCa 95% CI [0.39, 0.67]) with a large effect size, it showed no significant association with self-esteem at 4-weeks (r = 0.08, p = 0.199, BCa 95% CI [-0.14, 0.30]) or 8-weeks (r = 0.15, p = 0.07, BCa 95% CI [-0.05, 0.35]). Further, sense of belonging and self-concept clarity were significantly positively associated at baseline (r = 0.25, p = 0.005, BCa 95% CI [0.07, 0.43]), with a small effect size. However, baseline sense of belonging was not significantly associated with self-concept clarity at 4-weeks (r = 0.14, p = 0.079, BCa 95% CI [-0.07, 0.35]) or 8-weeks (r = 0.06, p = 0.278, BCa 95% CI [-0.22, 0.33]), after controlling for baseline self-concept clarity. Baseline school membership was significantly positively associated with self-concept clarity at baseline (r = 0.35, p < 0.001, BCa 95% CI [0.14, 0.55]) and at 4-weeks (r = 0.19, p = 0.02, BCa 95% CI [0.00, 0.36]), with a medium to small effect size, respectively. However, baseline school membership and 8-week self-concept clarity showed no significant association (r = 0.12, p = 0.109, BCa 95% CI [-0.07, 0.30]).

As shown in Table 3, self-esteem at baseline was significantly negatively associated with paranoia at baseline and at 4-weeks, after controlling for baseline paranoia, with medium to small effect sizes, respectively. However, baseline self-esteem was not significantly associated with 8-week paranoia. Self-esteem at 4-weeks was also significantly negatively associated with baseline and 4-week paranoia, with medium to small effect sizes, respectively, but not at 8-weeks. Moreover, baseline self-concept clarity showed a significant negative association with paranoia at baseline and at the 4-week follow-up, with medium to small effect sizes, respectively. However, baseline self-concept clarity and 8-week paranoia were not significantly associated. Finally, self-concept clarity at 4-weeks was significantly negatively associated with paranoia at baseline and 4-weeks, with medium effect sizes, and 8-weeks with a small effect size.

In sum, the cross-sectional correlational findings supported Hypothesis 1, but the longitudinal findings only provided partial support. Cross-sectionally, higher sense of belonging and school membership were associated with lower paranoia and higher self-esteem and self-concept clarity.

Additionally, higher self-esteem and self-concept clarity were associated with lower levels of paranoia. Longitudinally, however, baseline sense of belonging and school membership showed no significant associations with future levels of paranoia, when initial paranoia severity was controlled for. Higher self-esteem at baseline and 4-weeks were associated with lower levels of paranoia at 4-weeks, but not 8-weeks, after controlling for initial levels of self-esteem. Furthermore, higher self-concept clarity at baseline was associated with lower levels of paranoia at 4-weeks, but not 8-weeks, whereas higher self-concept clarity at 4-weeks was associated with lower levels of paranoia at both the 4- and 8-week follow-up, even when controlling for initial levels of self-concept clarity.

Table 3.

Bivariate and partial correlations between hypothesised predictors and mediators and the outcome variable across time-points (n = 108)

Variables	Baseline			4-weeks[a]			8-weeks[a]		
	r	*p*	BCa 95% CI	*r*	*p*	BCa 95% CI	*r*	*p*	BCa 95% CI
Sense of belonging T1	**-0.33**	**<0.001**	**-0.48, -0.16**	0.04	0.334	-0.18, 0.25	-0.11	0.127	-0.32, 0.11
School membership T1	**-0.50**	**<0.001**	**-0.64, -0.33**	0.02	0.410	-0.15, 0.18	-0.11	0.136	-0.28, 0.06
Self-esteem T1	**-0.43**	**<0.001**	**-0.57, -0.26**	**-0.16**	**0.051**	**-0.31, -0.01**	-0.16	0.050	-0.32, 0.00
Self-esteem T2	**-0.41**	**<0.001**	**-0.55, -0.23**	**-0.18**	**0.030**	**-0.34, -0.01**	-0.17	0.038	-0.33, 0.01
Self-concept clarity T1	**-0.46**	**<0.001**	**-0.60, -0.31**	**-0.23**	**0.008**	**-0.39, -0.06**	-0.12	0.104	-0.31, 0.05
Self-concept clarity T2	**-0.43**	**<0.001**	**-0.57, -0.28**	**-0.31**	**<0.001**	**-0.46, -0.14**	**-0.21**	**0.016**	**-0.37, -0.03**

Note. T1 = baseline, T2 = 4-week follow-up, BCa = bias-corrected and accelerated, CI = confidence interval

r = 0.10 = small effect size, *r* = 0.30 = medium effect size, *r* = 0.50 = large effect size

[a] Partial correlations with baseline paranoia adjusted.

Bootstrapping results based on 1000 samples.

One-tailed significance testing.

Significant correlations (CIs that did not cross zero) are highlighted in bold.

3.5. Hypothesis 2

Mediation analyses were conducted to examine whether self-esteem (M1) and self-concept clarity (M2) mediated the relationship between sense of belonging (IV1) and paranoia (DV) and school membership (IV2) and paranoia (DV). Analyses were first conducted in the cross-sectional sample, and then in the complete (longitudinal) data.

For all mediation models, bootstrapping with 5000 samples and the HC4 (Cribari-Neto, 2004) heteroskedasticity-consistent estimator were employed due to potential violations in homoskedasticity assumptions, as recommended by guidance (Hayes & Cai, 2007).

3.5.1. Cross-Sectional Hypotheses

Four simple mediation models were tested using T1 data. Details of the associations can be found in Tables 4 and 5.

Model 1) Sense of belonging → self-esteem → paranoia

The overall mediation model was significant, with sense of belonging explaining 9.6% of the variance in paranoia. The total effect (path c) of sense of belonging on paranoia was significant (β = -0.31, SE = 0.04, $p < 0.001$, 95% CI [-0.25, -0.08]), and when self-esteem was included in the model, the direct path (c^2) reduced but remained significant (β = -0.18, SE = 0.04, $p = 0.034$, 95% CI [-0.18, -0.01]). There were significant indirect effects of sense of belonging on paranoia via self-esteem (β = -0.13, SE = 0.04, 95% CI [-0.21, -0.06]), with self-esteem explaining 40.97% of the variance between sense of belonging and paranoia.

Model 2) Sense of belonging → self-concept clarity → paranoia

There was a significant direct effect (path c^2) of sense of belonging on paranoia, when controlling for self-concept clarity (β = -0.22, SE = 0.04, $p = 0.008$, 95% CI [-0.20, -0.03]). A significant indirect effect of sense of belonging on paranoia through self-concept clarity was also found (β = -0.09,

SE = 0.03, 95% CI [-0.16, -0.03]). Self-concept clarity explained 27.74% of the variance between sense of belonging and paranoia.

Model 3) School membership → self-esteem → paranoia

The overall mediation model was significant, with school membership explaining 25.2% of the variance in paranoia. The total effect (path c) of school membership on paranoia was significant (β = -0.50, SE = 0.06, $p < 0.001$, 95% CI [-0.53, -0.27]).

A significant direct effect (path c^2) of school membership on paranoia, when controlling for self-esteem, was found (β = -0.39, SE = 0.07, $p = < 0.001$, 95% CI [-0.46, -0.166]), as well as a significant indirect effect of school membership on paranoia through self-esteem (β = -0.11, SE = 0.05, 95% CI [-0.20, -0.03]. Self-esteem explained 22.11% of the variance in the relationship between school membership and paranoia.

Model 4) School membership → self-concept clarity → paranoia

There was a significant direct effect (c^2) of school membership on paranoia, when controlling for self-concept clarity (β = -0.40, SE = 0.07, $p = < 0.001$, 95% CI [-0.45, -0.18]). An indirect effect of school membership on paranoia through self-concept clarity was also found (β = -0.10, SE = 0.03, 95% CI [-0.17, -0.04], with self-concept clarity explaining 20.52% of the variance between school membership and paranoia.

In support of Hypothesis 2, Models 1 to 4 suggest that, cross-sectionally, greater sense of belonging and school membership are significantly associated with lower levels of paranoia. Including self-esteem and self-concept clarity in the models as mediators reduced the indirect pathways from sense of belonging and school membership to paranoia. This provides statistical support for partial mediation whereby the relationship between sense of belonging and paranoia and school membership and paranoia can be partially accounted for by their relationship to self-esteem and self-concept clarity.

Table 4.

Cross-sectional mediator analysis of sense of belonging on paranoia via self-esteem and self-concept clarity (T1).

Effect	Single mediator model									
	Self-esteem model					Self-concept clarity model				
	β	*B*	[b]SE	*t*	*p*	β	*B*	[b]SE	*t*	*p*
Belonging predicting mediator	0.36	0.11	0.03	4.30	<0.001	0.24	0.13	0.05	2.74	0.007
Mediator predicting paranoia	-0.35	-0.61	0.14	-4.22	<0.001	-0.37	-0.33	0.07	-4.98	<0.001
Direct effect	-0.18	-0.10	0.04	-2.14	0.034	-0.22	-0.12	0.04	-2.69	0.008
Indirect effect	-0.13[a]		0.04[a]	95% CI [-0.21, -0.06][a]		-0.09[a]		0.03[a]	95% CI [-0.16, -0.03][a]	

Note. [a]Bootstrapping results based on 5000 samples.

[b]Heteroscedasticity consistent standard error and covariance matrix estimator used.

Table 5.

Cross-sectional mediator analysis of school membership on paranoia via self-esteem and self-concept clarity (T1).

Effect	Single mediator model									
	Self-esteem model					Self-concept clarity model				
	β	*B*	[b]SE	*t*	*p*	β	*B*	[b]SE	*t*	*p*
School membership predicting mediator	0.55	0.25	0.03	8.21	<0.001	0.39	0.35	0.07	4.88	<0.001
Mediator predicting paranoia	-0.20	-0.35	0.14	-2.54	0.012	-0.26	-0.24	0.06	-3.68	<0.001
Direct effect	-0.39	-0.31	0.07	-4.24	<0.001	-0.40	-0.32	0.07	-4.66	<0.001
				95% CI					95% CI	
Indirect effect	-0.11[a]		0.05			-0.10[a]		0.03		
				[-0.20, -0.03][a]					[-0.17, -0.04][a]	

Note. [a]Bootstrapping results based on 5000 samples.

[b]Heteroscedasticity consistent standard error and covariance matrix estimator used.

3.5.1.1. Follow-Up Exploratory Analysis

As self-esteem and self-concept clarity both emerged as significant mediators and they are potentially interrelated concepts, they were entered into two separate parallel mediation models to explore the combined and unique contributions of each mediator, while controlling for the presence of the other (see Tables 6 & 7).

When examined in parallel, a significant direct effect of sense of belonging on paranoia, when controlling for self-esteem and self-concept clarity, was found (β = -0.19, SE = 0.04, *p* = 0.028, 95% CI [-0.18, -0.01]). A significant indirect effect was found for self-concept clarity (β = -0.06, SE = 0.03, 95% CI [-0.13, -0.01]), but not for self-esteem (β = -0.06, SE = 0.04, 95% CI [-0.16, 0.01]). In this model, self-concept clarity explained 19.35% of the variance between sense of belonging and paranoia.

A significant direct effect was also found for school membership on paranoia (β = -0.38, SE = 0.07, *p* = < 0.001, 95% CI [-0.44, -0.17]). Similarly, a significant indirect effect was found for self-concept clarity (β = -0.09, SE = 0.04, 95% CI [-0.18, -0.02]), but not for self-esteem (β = -0.03, SE = 0.06, 95% CI [-0.14, 0.08]). Self-concept clarity explained 18.53% of the variance between school membership and paranoia.

These results suggest that only self-concept clarity partially mediates the relationship between sense of belonging and paranoia and school membership and paranoia, and the mediating effect of self-concept clarity is independent of self-esteem. Therefore, self-concept clarity plays a larger role in explaining the relationship between adolescent sense of belonging and paranoia, and self-esteem does not significantly contribute to this relationship.

Table 6

Cross-sectional mediator analysis of sense of belonging on paranoia, including self-esteem and self-concept clarity as parallel mediators (T1)

Mediation pathway	Sense of belonging as predictor					Mediator predicting paranoia					Indirect effect	
	β	*B*	[b]SE	*t*	*p*	β	*B*	[b]SE	*t*	*p*	β	95% CI
Self-esteem	0.36	0.11	0.03	4.30	<0.001	-0.17	-0.30	0.19	-1.62	0.107	-0.06[a]	-0.16, 0.01[a]
Self-concept clarity	0.24	0.13	0.05	2.74	0.007	-0.26	-0.23	0.09	-2.66	0.009	-0.06[a]	-0.13, -0.01[a]
Direct effect of belonging	-0.19	-0.10	0.04	-2.22	0.028							

Note. [a]Bootstrapping results based on 5000 samples.

[b]Heteroscedasticity consistent standard error and covariance matrix estimator used.

Table 7

Cross-sectional mediator analysis of school membership on paranoia, including self-esteem and self-concept clarity as parallel mediators (T1)

Mediation pathway	School membership as predictor					Mediator predicting paranoia					Indirect effect	
	β	*B*	[b]SE	*t*	*p*	β	*B*	[b]SE	*t*	*p*	β	95% CI
Self-esteem	0.55	0.25	0.03	8.21	<0.001	-0.05	-0.08	0.18	-0.46	0.650	-0.03[a]	-0.14, 0.08[a]
Self-concept clarity	0.39	0.35	0.07	4.88	<0.001	-0.24	-0.21	0.09	-2.53	0.012	-0.09[a]	-0.18, -0.02[a]
Direct effect of school membership	-0.38	-0.31	0.07	-4.34	<0.001							

Note. [a]Bootstrapping results based on 5000 samples.

[b]Heteroscedasticity consistent standard error and covariance matrix estimator used.

3.5.2. Longitudinal hypotheses

Four simple mediation models were run with the longitudinal data. In all analyses, baseline measurements of paranoia and self-esteem/self-concept clarity were controlled for to reduce potential bias and ensure that temporal changes over time were captured accurately. Details of the models can be found in Tables 8 and 9.

Models 5) T1 sense of belonging → T2 self-esteem → T3 paranoia

6) T1 sense of belonging → T2 self-concept clarity → T3 paranoia

The total effect of T1 sense of belonging on T3 paranoia was not statistically significant in either models (β = -0.05, SE = 0.05, *p* = 0.569, 95% CI [-0.12, 0.07]; β = -0.07, SE = 0.05, *p* = 0.424, 95% CI [-0.13, 0.06], respectively), suggesting that no direct associations were found between baseline sense of belonging and paranoia 8-weeks later.

When examining self-esteem as a possible mediator (model 5), no direct effect (β = -0.06, SE = -0.03, *p* = 0.528, 95% CI [-0.12, 0.06]) or indirect effect was observed (β = -0.004, SE = 0.01, 95% CI [-0.02, 0.04]). The model without baseline paranoia and self-esteem scores explained 9.49% of the variance in paranoia at 8-weeks, and when included in the model, the explained variance increased to 52.66%. Therefore, baseline paranoia and self-esteem accounted for an additional 43.17% of the variance.

In model 6, no direct effect (β = -0.06, SE = 0.05, *p* = 0.522, 95% CI [-0.12, 0.06]) or indirect effect (β = -0.02, SE = 0.02, 95% CI [-0.06, 0.02]) was found for the mediating role of self-concept clarity. The model without baseline paranoia and self-concept clarity explained 9.49% of the variance in paranoia at 8-weeks, and when included in the model, the explained variance increased to 52.37%, indicating that baseline paranoia and self-concept clarity accounted for an additional 42.88% of the variance.

Models 7) T1 school membership → T2 self-esteem → T3 paranoia

8) T1 school membership → T2 self-concept clarity → T3 paranoia

The total effect of T1 school membership on T3 paranoia was not statistically significant in either model (β = -0.04, SE = 0.07, *p* = 0.633, 95% CI [-0.17, 0.10]; β = -0.07, SE = 0.06, *p* = 0.328, 95% CI [-0.18, 0.06], respectively), suggesting that no direct associations were found between baseline school membership and 8-week paranoia.

When examining the influence of self-esteem, no direct effect (β = -0.04, SE = 0.07, *p* = 0.67, 95% CI [-0.17, 0.10]) or indirect effect was observed (β = -0.004, SE = 0.02, 95% CI [-0.05, 0.03]). No direct effect (β = -0.05, SE = 0.06, *p* = 0.527, 95% CI [-0.16, 0.08]) or indirect effect (β = -0.02, SE = 0.02, 95% CI [-0.07, 0.01]) was found for the mediating role of self-concept clarity either.

Both models without baseline paranoia and self-esteem/self-concept clarity explained 17.56% of the variance in paranoia at 8-weeks. When included in the models, the explained variance increased to 52.5% and 52.3% respectively. This indicates that baseline paranoia and self-esteem accounted for an additional 34.94% of the variance between baseline school membership and 8-week paranoia, and baseline paranoia and self-concept clarity accounted for an additional 34.74%.

Overall, the longitudinal results do not support Hypothesis 2. Baseline sense of belonging and school membership did not predict paranoia 8-weeks later, and no mediating effects of self-esteem and self-concept clarity at 4-weeks were found, after controlling for baseline levels.

Table 8

Longitudinal mediator analysis of T1 sense of belonging → T2 self-esteem/self-concept clarity → T3 paranoia

Effect	Single mediator model									
	Self-esteem model					Self-concept clarity model				
	β	*B*	[b]SE	*t*	*p*	β	*B*	[b]SE	*t*	*p*
T1 belonging predicting T2 mediator	-0.04	-0.01	0.02	-0.61	0.543	0.07	0.04	0.04	0.93	0.353
T2 mediator predicting T3 paranoia	-0.11	-0.18	0.33	-0.54	0.590	-0.24	-0.21	0.14	-1.57	0.119
Direct effect	-0.06	-0.03	0.05	-0.63	0.528	-0.06	-0.03	0.05	-0.65	0.522
Indirect effect	-0.004[a]		0.01	95% CI [-0.02, 0.04][a]		-0.02[a]		0.02	95% CI [-0.06, 0.02][a]	

Note. T1 = baseline measurement, T2 = 4-week follow-up, T3 = 8-week follow-up

Covariates include baseline paranoia and baseline self-esteem/self-concept clarity.

[a]Bootstrapping results based on 5000 samples.

[b]Heteroscedasticity consistent standard error and covariance matrix estimator used.

Table 9

Longitudinal mediator analysis of T1 school membership → T2 self-esteem/self-concept clarity → T3 paranoia

Effect	Single mediator model									
	Self-esteem model					Self-concept clarity model				
	β	*B*	[b]SE	*t*	*p*	β	*B*	[b]SE	*t*	*p*
T1 school membership predicting T2 mediator	0.04	0.02	0.04	0.45	0.655	0.10	0.10	0.05	1.82	0.071
T2 mediator predicting T3 paranoia	-0.10	-0.16	0.33	-0.48	0.631	-0.24	-0.21	0.13	-1.60	0.112
Direct effect	-0.04	-0.03	0.07	-0.42	0.673	-0.05	-0.04	0.06	-0.64	0.527
Indirect effect	-0.004[a]		0.02	95% CI [-0.05, 0.03][a]		-0.02[a]		0.02	95% CI [-0.07, 0.01][a]	

Note. T1 = baseline measurement, T2 = 4-week follow-up, T3 = 8-week follow-up

Covariates include baseline paranoia and baseline self-esteem/self-concept clarity.

[a]Bootstrapping results based on 5000 samples.

[b]Heteroscedasticity consistent standard error and covariance matrix estimator used.

4. Discussion

This study examined the role of sense of belonging, school membership, self-esteem, and self-concept clarity on adolescent paranoia with a non-clinical school cohort of adolescents. The primary aims were to test hypotheses that developing a strong sense of belonging to important social groups is associated with reduced risk of paranoia in adolescence, and that this relationship is mediated by self-esteem and self-concept clarity. These associations were tested cross-sectionally with baseline data and longitudinally over a period of 8-weeks. The findings will be discussed in relation to the cross-sectional and longitudinal findings, with respect to the differences found, and will be evaluated by taking into account the study's strengths and limitations. The implications of the findings and possible future directions for research will be explored.

4.1. Summary of The Findings

The cross-sectional findings provided support for both hypothesis 1 and 2. The correlational results demonstrated that higher sense of belonging and school membership were associated with lower levels of adolescent paranoia. Furthermore, a higher sense of belonging and school membership were related to higher self-esteem and self-concept clarity, and higher self-esteem and self-concept clarity were also associated with lower paranoia, when measured at one time-point.

When the mediation models were examined, it was found that higher levels of belonging, including sense of belonging to various social groups and school belonging specifically, were associated with lower paranoia. The findings showed support for partial mediation as self-esteem and self-concept clarity both independently explained some of this relationship. However, when explored in parallel, only self-concept clarity emerged as a significant mediator of the relationship between both sense of belonging and paranoia and school belonging and paranoia. Therefore, self-concept clarity continued to explain a significant portion of the variance in the relationship between belonging and paranoia, even when self-esteem was included in the model. These findings provided preliminary support for the proposed model whereby increased sense of belonging to various social groups and

contexts may be associated with less paranoid thinking through self-esteem and self-concept clarity. They also suggested, for the first time, that self-concept clarity may be a more important mediator in this relationship.

Importantly, however, these findings were not replicated longitudinally. When the relationships between the variables were examined over time, both sense of belonging and school membership showed no association with future levels of paranoia. Sense of belonging and school membership were not associated with future levels of self-esteem either. While sense of belonging showed no association with future levels of self-concept clarity, school membership was only associated with self-concept clarity at the 4-week follow-up, but not at 8-weeks. The findings with regards to the associations between self-esteem and self-concept clarity and future levels of paranoia were mixed. The resulted showed that higher levels of self-esteem and self-concept clarity at baseline were associated with lower levels of paranoia at 4-weeks, but not at 8-weeks. Moreover, 4-week self-esteem and 8-week paranoia were not associated, but 4-week self-concept clarity was associated with 8-week paranoia.

When the temporal relationships were examined using mediation analysis, no associations were found between baseline sense of belonging and school membership and paranoia 8-weeks later, as well as no mediating effects of 4-week self-esteem and self-concept clarity. The results suggested that after accounting for initial levels of paranoia and self-esteem/self-concept clarity, belonging did not independently predict paranoia at follow-up, and self-related processes did not mediate this association. Further, the significant increase in the portion of variance explained when baseline measurements were included, indicated that initial paranoia severity and initial levels of self-esteem/self-concept clarity may be highly predictive of future paranoia. Therefore, in contrast to Monsonet et al (2023), a longitudinal pathway from belonging on paranoia via self-esteem and self-concept clarity was not supported for adolescents. Thus, the hypotheses were not supported.

4.2. Discussion of The Findings

While the cross-sectional findings provided preliminary evidence for the social identity model of paranoia proposed in the adult literature (Greenaway et al., 2018; McIntyre et al., 2018a; Monsonet et al., 2023), they should be interpreted with caution. The study's cross-sectional findings cannot determine a temporal sequence of the variables or in fact the directionality of relationships, and therefore risk of spurious relationships is possible. Given the limitations of using cross-sectional data for mediation analysis (Montoya, 2022) and the lack of longitudinal evidence, no inferences can be made about how belonging and self-related processes impact on adolescent paranoia in over time.

The longitudinal correlational findings are similar to those found by Bird et al. (2017), where associations between baseline self-esteem, peer bullying, and cyber victimisation, and paranoia at the 3-month follow-up were no longer significant after controlling for baseline paranoia severity. However, the present study utilised a non-clinical sample of adolescents, rather than a clinical, help-seeking sample which may have been exposed to treatment effects. Moreover, although the present study had a larger sample, the follow-up period was shorter and may not have been long enough to capture change in paranoia.

The lack of longitudinal evidence may be due to the sample size. Due to challenges with recruitment and attrition (see Chapter 3), the sample size was lower than the a priori power calculation. This may have led to more error variance and reduced statistical power to detect effects (Schoemann et al., 2017). To account for this and reduce the likelihood of Type 1 error, the bootstrap method was employed which has been recommended over other methods in the case of small samples (Caron, 2019; Sim et al. 2022). However, the need to control for baseline paranoia and self-esteem/self-concept clarity may have required an even larger sample size to detect effects. Further, due to timing constraints, a relatively short follow-up period of 8-weeks was employed to examine the influence of belonging on self-related processes, and subsequently on paranoia. This is reflected in the stability of mean paranoia scores, which did not significantly change between time points.

Previous research has already established an association between higher self-esteem and lower levels of paranoia in similar school cohorts of children and adolescents (Bird et al., 2019; Kingston et al., 2022). However, the present study extended what is already known by finding an association between self-concept clarity and paranoia, which, to the best of our knowledge, had not previously been investigated in adolescence. While the findings should be interpreted with caution, the cross-sectional analysis showed that self-esteem and self-concept clarity accounted for a significant portion of the variance between belonging and paranoia. Self-esteem explained 40.97% and self-concept clarity explained 27.74% in the relationship between general sense of belonging and paranoia. A smaller portion of variance between school belonging and paranoia was explained by self-esteem (22.11%) and self-concept clarity (20.52%). The latter findings are more similar to McIntyre et al. (2018a), where self-esteem explained 17% of variance between friendship identification and paranoia. Although further longitudinal investigation is required, these findings could suggest that identification with specific social groups or contexts alone may impact on paranoia through self-related processes. However, self-esteem and self-concept clarity may play a more significant role in the relationship between collective sense of belonging (i.e., to friends, family, culture/ethnicity, online communities, school, and peers at school) and paranoia. This is in-keeping with the theoretical and empirical literature which suggests that multiple group identification is an important source of personal identity (Jetten et al., 2015).

The finding that mean self-esteem scores significantly increased from baseline measurement to the 8-week follow-up was unexpected. It is unclear what may account for this significant, albeit small increase (mean difference = 0.71). It is possible that this related to most participants completing baseline measures during or close to an examination period, whereas the 8-week follow-up was outside of this period. However, given that it was not anticipated, it is not possible to say what accounted for this and corresponding differences were not found for self-concept clarity.

The finding that self-concept clarity may play a more important role than global self-esteem in explaining the relationship between belonging and paranoia offers some support for the conclusions made by Thewissen et al. (2008). The findings highlight the importance of investigating the role of self-concept clarity in the development and maintenance of paranoia, which so far has been a neglected area of research in adults and especially adolescents. Self-determination theory (Deci & Ryan, 1995) may help to explain these findings. The theory posits that self-concept clarity is crucial for fulfilling needs for autonomy, competence and relatedness, which are important for mental health and well-being. Therefore, belonging to valued social groups may provide an individual with a clearer and more consistent understanding of who they are as social relationships provide a source of social feedback. Having a more stable internal framework may help individuals to make sense of uncertain social experiences, reducing worry and anxiety, and thus protecting one against interpreting social interactions inaccurately or as threatening. While only cross-sectional evidence of an association has been found in the present study and thus directionality cannot be assumed, supporting adolescents to develop a clear and stable sense of self may have benefits for their well-being.

The present findings offer support for the paranoia continuum existing in adolescence. Although the mean level of paranoia severity was indicative of clinical levels of persecutory ideation, the spread of scores indicated that most of the adolescents included in the sample experienced lower levels of mistrust towards others and a few experienced more severe paranoia suggestive of persecutory delusion (Freeman et al., 2019). These findings are noteworthy, however, as they indicate relatively high levels of paranoia for general population adolescents, compared to previous research (Kingston et al., 2022; Schlier et al., 2024). This may have been impacted by the higher-than-average rate of mental health diagnoses in the present sample, compared to the national average (NHS Digital, 2023). It is also possible that the increasing levels of paranoia in young people may reflect the changing social make-up of society. The COVID-19 pandemic particularly affected young people, for example, their ability to attend school, learn, and socialise. It increased feelings of uncertainty, anxiety, and beliefs about harm (Shah et al., 2020), and thwarted opportunities for young people to belong (Allen

et al. 2021). Experiences of paranoia in young people may have evolved as an understandable response to these challenges (Raihani & Bell, 2019). These results demonstrate that studying the continuum of paranoia experiences in adolescents is worthy of study.

4.3. Strengths and Limitations

As far as the researchers are aware, the findings examined an area of research in adolescents that has not been examined before and the study extended the limited evidence base on adolescent paranoia through its longitudinal and developmentally sensitive methodology. This allowed for a novel exploration into factors that are highly relevant to young people.

A non-clinical sample of general population adolescents was used and no exclusion criteria was employed. This allowed for the study of adolescents independent of treatment effects and may have captured a more representative sample of young people experiencing paranoia in the general population (Blanco et al., 2017; Humphreys, 2017). However, despite this, the sample was not overly representative as it was majority white British, and the schools that took part were in relatively affluent, non-diverse areas. Obtaining a more diverse sample is important given that feeling different from others may influence one's sense of belonging, identity formation and fuel paranoid thinking (Erentaitė et al., 2018). Paranoia is known to be elevated in social and ethnic minority populations and factors such as discrimination can impact on the development of psychosis (Shaikh et al., 2016). A larger, more diverse sample may have allowed for increased power to control for additional variables in the analysis; for example, demographic and clinical characteristics, such as, ethnicity, place of birth, socioeconomic status, and gender, which are known to influence both sense of belonging and paranoia (Bukowski et al., 2011; Harper, 2011).

The study utilised self-report measures, which were completed by adolescents in the presence of the researcher, their peers at school and a teacher. Although the whole classroom approach to data collection was efficient and practical for schools, it may have introduced response bias. It is also possible that the questionnaire methods were cognitively demanding on participants and may have

led to fatigue. To account for this limitation, questionnaires were randomised in terms of order, and piloting with experts by experience indicated that testing sessions would take approximately 20 minutes. Further, due to resource and time constraints, data were collected from schools at different time-points. As changes to self-concept and paranoia can happen over time and in response to social factors (Freeman et al., 2011), it is possible that measurement bias occurred.

4.4. Implications

Notwithstanding the limitations, investigating the relationships between belonging, self-esteem, self-concept clarity and paranoia is a new area of focus and contributes to the broader understanding of adolescent paranoia. The study's findings show that investigating paranoia in non-clinical adolescent populations is valid and important. Given that mental health challenges in young people are a growing public health concern (Kieling et al., 2024), the findings provide valuable insights into adolescent paranoia with potential for informing interventions and improving adolescent mental health outcomes.

Given the large associations found between school membership and paranoia, the present study has highlighted the importance of understanding the impact of school belonging on adolescent paranoia, and the role that schools play in shaping their student's mental health and well-being. This is line with the evidence base suggesting that paranoia may have its origins in negative school experiences (Bird et al., 2022; Harper & Timmons, 2021; Jack & Egan, 2018). Enhancing school belonging should be considered for schools seeking to promote positive mental health. Approaches such as peer mentorship, school initiated social activities, offering clubs, promoting positive relationships between students and teachers, and developing curriculums that incorporate socio-emotional skills (Allen et al., 2022), may all be beneficial. Furthermore, a targeted approach where school staff receive training on recognising signs of social exclusion and creating environments that support differentiation alongside belonging are needed, as well as actively supporting minoritised,

disadvantaged and divergent students. It is, however, acknowledged that education requires the necessary funding and resources to implement approaches known to be helpful (Warnes et al., 2021).

Though the results are tentative and require further elucidation, the study has potential wider implications for clinical practice and policy. Whilst taking a dimensional approach to mental health and offering targeted clinical interventions that support symptoms of paranoia may be effective (Monaghesh et al., 2022; Shore et al., 2018), it is widely acknowledged that mental health is influenced by the conditions in which we live (World Health Organisation, 2014). Government policies that prioritise the social determinants of mental health and acknowledge that social connection as a public health necessity is needed to rebuild communities that foster a strong sense of connection post-pandemic (Holt-Lunstad, 2022). There is a need for clinicians to use community centred approaches and community engagement, as recommended by NICE (2016) and Public Health England (2015). Shifts in policy alongside social and community interventions may shape supportive social contexts that offer opportunities to enrichen young people's lives and may prevent the development of mental health difficulties (Daffin et al., 2022).

4.5. Future Directions for Research

In light of the study's findings and limitations, it is evident that more research is needed to examine how paranoia develops over time, the factors that influence it, as well as the long-term impact of childhood paranoia. Research should seek to better understand the structure of paranoia in young people, including why it worsens for some, what factors trigger escalation into clinical presentations, and importantly what protects young people from paranoid concerns. In particular, given the association between social factors and paranoia in adolescence (Bird et al., 2019; Bird et al., 2021; Bird et al., 2022), as well as the developmental significance, the present study would benefit from replication in a larger sample and over a longer timeframe to clarify whether the non-significant findings are valid.

A larger sample size may also allow for investigation into more complex models, such as examining bidirectional and moderating effects. For example, it is possible that higher self-esteem and self-concept clarity may make it more likely for an individual to feel that they belong, as well as being a product of feeling a sense of belonging. These hypotheses are supported by research demonstrating bidirectional relationships between social relationships and self-esteem (Harris & Orth, 2020) and self-concept clarity (Becht et al., 2017), indicating that there may be a positive feedback loop between them. Likewise, although self-esteem is implicated in paranoia development (Bentall et al., 2001; Freeman et al., 2005), paranoia may also cause changes to the self over time as the negative self-evaluations triggered by paranoia can diminish self-esteem and lead to uncertainty in one's identity (Kesting & Lincoln, 2013; Kingston et al., 2022; Thewissen et al., 2011). Moreover, increased sense of belonging may lead to enhanced self-concept clarity which reduces paranoid thinking, but this may depend on level of self-esteem. Thus, examining mediating and moderating effects longitudinally may lead to a more nuanced understanding of adolescent paranoia.

Paranoia is experienced and expressed differently across different cultures and contexts (Elahi et al., 2022; McIntyre et al., 2021; McIntyre et al., 2016). For minoritised groups, instead of reflecting problematic belief systems, "paranoia" may be a healthy, adaptive response to social adversities, such as discrimination (Kingston et al., 2023). Therefore, research seeking to better understand the adolescent experience should investigate paranoia with more geographically and culturally diverse samples. This may improve the generalisability of research findings and allow for insights into how paranoia operates across minority and majority groups. Specifically, an important avenue for research would be to understand how intersectionality influences paranoia over time in young people.

Although school belonging has been associated with a range of mental health outcomes (Allen et al., 2024), the present findings established a strong association between school belonging and paranoia. Given this, along with other research which has shown that adolescents experience high levels of mistrust at school (Wong et al., 2014), investigating how paranoia plays out in important social

contexts to adolescents may be important and warrants further exploration. A possible future direction is examining what factors help adolescents to feel like they belong within school and how this supports trustful relationships within the school environment.

An interesting avenue for future research would be to examine the prediction of social connection factors on paranoia using ESM measures at different points in adolescents' schooling. ESM is an advantageous methodology for assessing social interactions, allowing for a deeper understanding of adolescent's experiences as they occur in daily life, whilst minimising recall bias, enhancing precision and accuracy of measurement, and allowing for the study of between- and within-person differences (Mölsä et al., 2022). This may also offer valuable insights into whether sense of belonging earlier on or later in school is equally as predictive of paranoia.

The finding that only self-concept clarity was uniquely associated with paranoia suggests that coherence and stability of self-identity may be important to the adolescent paranoia experience. This requires further exploration, and future research may wish to assess both self-esteem and self-concept clarity to explore their unique and interrelated roles in paranoia development and maintenance.

Given the phenomenological overlap between paranoia and social anxiety, and that they often co-occur (Pisano et al., 2016; Schutters et al., 2012), the present study conceptualised paranoia as fear of harm and beliefs about threats to safety, rather than fear of being negatively judged which is more associated with socially anxious concerns (Horton et al., 2014). In doing so, the R-GPTS persecution subscale was utilised to measure adolescent paranoia. Recent evidence has demonstrated its superior psychometric properties over other scales for non-clinical populations (Statham et al., 2019) and in adolescence (Schlier et al., 2024). The scales used by McIntyre et al. (2018a), Monsonet et al. (2023) and Kesting et al. (2013) could be critiqued for not sensitively and validly capturing this fear of harm and not assessing the full paranoia hierarchy (Statham et al., 2019). To enhance comparability across studies and validity of measurement, studies may wish to use the R-GPTS. Further, while inclusion in the present study may have further reduced statistical power, future studies could include social

anxiety as a confounding variable to ensure that the unique effect of paranoia is captured more accurately.

4.6. Conclusion

This study extends the evidence base seeking to understand the adolescent paranoia experience. It is the first study to examine the relationship between belonging, self-esteem, self-concept clarity and paranoia in adolescence. The findings demonstrated cross-sectional evidence of an association between belonging and paranoid thinking, through self-esteem and self-concept clarity. Although longitudinal examination of how these factors evolved over time did not find any significant effects, the social identity model of paranoia in adolescents requires further evaluation in larger, longitudinal and experimental studies to determine temporal and potential causal relationships. Nonetheless, the findings contribute to the understanding of adolescent paranoia, which has been a relatively neglected area of focus for research. Given the significance to the adolescent developmental period, more research is needed to understand how social relationships and contexts shape adolescent paranoia. The findings demonstrate the importance of investigating dimensional aspects of the self, such as self-concept clarity, in understanding paranoia. Moreover, enhancing adolescents school belonging through social initiatives may have important implications for improving their student's mental health and well-being. Tackling the social determinants of health may help to reduce the rising prevalence of mental health challenges, including paranoia, during this sensitive period of development.

Chapter 2: Systematic Review

‘Can the Cognitive Model of Persecutory Delusions be Applied to Children and Adolescents?’

Abstract

The cognitive model of persecutory delusions (Freeman et al., 2002) implicates six core processes in the development and maintenance of paranoia. The model is supported by research in adults, but there is limited understanding about whether it applies to child and adolescent groups, despite the high prevalence of paranoia during adolescence. This systematic review aimed to narratively synthesise the literature to determine the extent to which the cognitive model could be applied to paranoia in youth. Three electronic databases, PsychInfo, Web of Science and PubMed, and reference lists were searched to identify studies. Eligibility criteria included quantitative studies examining the association between self-report paranoia and worry/anxiety, negative self-beliefs, internal anomalous experiences, sleep disturbances, reasoning biases, and safety behaviours, in clinical or non-clinical samples under the age of 18. Of 3,164 results, 14 studies fulfilled criteria. Modified versions of the Newcastle–Ottawa scales (Wells et al., 2000) were used for quality assessment. Most studies examined general population young people (*n* = 10). Strong evidence emerged for the association between paranoia and worry/anxiety and negative self-beliefs. Results suggested that sleep impacts on paranoia through negative affect. Weak evidence emerged for direct effects of hallucinations, dissociation and reasoning biases on paranoia. The low number of studies (*n* = 2) precluded conclusions regarding safety behaviours. Findings suggested that most processes implicated in the model are associated with adolescent paranoia, but more longitudinal research is needed to establish what factors cause and maintain it. The review is limited by cross-sectional evidence and high levels of heterogeneity, including inconsistent paranoia measures. The narrow focus and subjective interpretation of the cognitive model may have resulted in omission of relevant studies. This review advances the theoretical understanding of adolescent paranoia and highlights the need for more developmentally sensitive investigations to help establish adolescent-specific paranoia models (CRD42023410832).

1. Introduction

Paranoia refers to the exaggerated belief that others intend to cause one harm (Freeman & Garety, 2014). As mentioned in Chapter 1, paranoia exists on a continuum of severity with persecutory delusions (PD) at the severe end (Freeman, 2024). Although it is recognised that paranoia is commonly experienced by both general population and clinical groups of children and adolescents (Bird et al., 2021; Kingston et al., 2022), little is known about the adolescent experience of paranoia. There is a lack of understanding about if and how theoretical models from adults apply to child and adolescent groups.

1.1. The Cognitive Model of Persecutory Delusions

One influential psychological model for understanding paranoia is the cognitive model of PD, proposed by Freeman and colleagues (Freeman et al., 2002; Freeman, 2016). This approach recognises the shared contribution of genetic and environmental risk that makes an individual vulnerable to PD, or threat beliefs (see Chapter 1), and suggests that six core processes interact to contribute to their causation and maintenance. These include worry, negative self-beliefs, anomalous experiences, reasoning biases, safety-seeking behaviours and sleep dysfunction.

The model suggests that the unfounded belief that others deliberately intend to cause one harm activates the threat system, triggering anxiety-related processes of threat anticipation. The worry thinking style that individuals with PD often present with evokes threat beliefs, keeps them in mind and worsens the distress caused by them. As individuals with PD have often suffered negative interpersonal experiences, they are more likely to develop a negative self-view. Feeling less than, different to others and thus vulnerable to harm or deserving of harm all cause more paranoid thinking. Anomalous internal experiences, such as unusual bodily sensations, hallucinations, or dissociation, are worsened by worry and anxiety and result in more frightening interpretations, such as there being external danger. Individuals with PD often present with reasoning biases, such as belief inflexibility, decreased data gathering, and less analytical thinking. These biases mean that threat beliefs remain

unchallenged because the individual is less able to seek alternative explanations. To protect oneself against the threat beliefs, an individual may engage in protective defensive strategies that inadvertently reinforce the beliefs because they limit access to evidence that disconfirms the threat. These safety seeking-behaviours commonly include avoiding feared situations and becoming hypervigilant to threat. Lastly, sleep difficulties, such as nightmares and insomnia, worsen these processes and inhibit the individual's access to coping skills (Freeman et al., 2002; Freeman, 2016; Freeman & Garety, 2014). A growing body of research has supported the cognitive model in adults, which are discussed below.

1.2. Evidence For the Cognitive Model in Adults

Anxiety is considered a key emotion related to the onset and maintenance of threat beliefs (Freeman et al., 2002). Anxiety arises from unhelpful thoughts about future threats and is characterised by cognitive and physiological changes and may lead to avoidance behaviours that maintain it (Grupe & Nitschke, 2013). The cognitive model posits that paranoia occurs in the presence of long-standing anxiety, as anxiety heightens paranoia increases, and reducing anxiety levels may lead to decreased paranoia. For example, anxiety-related cognitive processes, such as worry (Mathews, 1990), can make individuals preoccupied with threat which can reinforce the feeling that threat is imminent. Startup et al. (2007) showed that 21% of individuals experiencing PD had clinical levels of worry and 68% had levels that were comparable to individuals seeking treatment for Generalised Anxiety Disorder. Longitudinal evidence shows that both anxiety and worry strongly predict the onset and persistence of paranoia in general population and clinical adults (Freeman et al., 2012; Thewissen et al., 2011). Sun et al. (2019) confirmed these findings but also showed that anxiety and paranoia reinforced each other over a period of a year, providing support for the cognitive model. However, it was also found that worry and negative beliefs about worry (i.e., metacognitions) mediated this relationship, but while metacognitions independently predicted paranoia, worry did not. Meta-analytic evidence suggests medium to large effects of anxiety on paranoia following anxiety induction paradigms (Ellett et al., 2023). A review by Bennetts et al. (2021) demonstrated the causal role of

anxiety in increased paranoia following experimental manipulations in both clinical and non-clinical populations. However, a key finding of the review was that negative affect, rather than anxiety, may be more relevant. The literature suggests that both anxiety and worry are important for understanding the onset of paranoia, however, anxiety or negative affect more broadly may be more important than worry. Further, the findings support the hierarchy of paranoia (see Chapter 1; Freeman et al., 2005), as they show that paranoia builds on more common anxious concerns.

As outlined in Chapter 1, PD are thought to rest on a base of common feelings of the self as different and hence vulnerable (Freeman et al., 2002). Recent meta-analytic evidence by Humphrey et al. (2021) showed moderate to strong associations between paranoia and negative self-schemas in adults with and without psychosis. However, this association was often confounded by factors, such as depression, and they found large heterogeneity in the studies included. Two longitudinal studies (Fowler et al. 2012; Udachina et al., 2009) suggested that negative self-schemas precede paranoia, but one study found no evidence of this direction when controlling for depression, other symptoms of psychosis, problem-solving and worry (Vorontsova et al., 2013). Longitudinal evidence suggested that while negative self-beliefs are likely to predict future paranoia, depression may mediate this association (Galbraith et al., 2014b). Furthermore, experimental evidence demonstrated that experimental manipulations of low self-confidence led to more paranoid thinking (Atherton et al., 2016), self-esteem mediated the impact of induced social stress on paranoia (Kesting et al., 2013) and the impact of attachment imagery on paranoia was mediated by negative self-beliefs (Sood et al., 2021). Therefore, the evidence is suggestive of a causal relationship whereby negative self-beliefs lead to increased paranoid thinking.

Unusual internal experiences are proposed to incite fearful explanations for threat beliefs. The model implies that ambiguous external events may be misinterpreted as threatening or personal when the individual is in an unsettled state (Freeman & Garety, 2014). Experiences may include unexplained anxiety symptoms, dissociation, aberrant salience and hallucinations (Freeman & Loe, 2023), and may

be triggered by difficult life events, illicit drugs or poor sleep (Freeman & Garety, 2014). Thus, the appraisal of the experiences is likely to lead to the development of persecutory ideation (Bentall et al., 2001). A large cross-sectional study with general population adults showed large positive associations between paranoia and dissociation, hallucinations, and aberrant salience (Freeman & Loe, 2023). Research with individuals with first episode psychosis (FEP) and at clinical high risk of psychosis (CHR) suggests that hallucinations often co-occur with paranoia, but paranoia is often present without hallucinatory experiences (Hermans et al., 2020). Using ESM, Hermans et al. (2020) found no association between paranoia and hallucinations in the daily life of FEP and CHR populations, but Buck et al. (2019) found that for individuals with psychosis, paranoia increased as individuals experienced worse hallucinations. A review by Lüdtke et al. (2023) suggested that paranoia and aberrant salience, which refers to the misattribution of irrelevant stimuli as being important, occur alongside each other across the paranoia continuum. However, the association between them may be influenced by liberal acceptance bias (i.e., a tendency to accept information as true). Furthermore, in an experimental setting, Freeman et al. (2008) showed that general population adults who were experiencing perceptual anomalies were more likely to react with paranoia in a neutral virtual reality (VR) social situation. Overall, the evidence base is mixed but suggests that anomalous experiences may both co-occur and contribute to the development of paranoia in adults, and the association between them may be impacted by cognitive biases.

Biases or deficits in reasoning are often found in individuals experiencing paranoia. Reasoning biases are unhelpful thinking patterns that lead to (mostly) inaccurate conclusions (Garety & Freeman, 1999). The cognitive model suggests that as individuals try to make sense of their paranoid or anomalous experiences, their interpretations are influenced by reasoning biases. In support of this, Freeman and Loe (2023) showed that, cross-sectionally, paranoia had a large negative association with use of analytical reasoning. This suggests that individuals with high levels of paranoia show less use of logical thinking processes when making decisions, which may mean that paranoid ideas remain

unchallenged. Lower levels of analytical thinking can contribute to several biases implicated in the development of paranoia.

One well-researched bias in the literature is the Jumping to Conclusions (JTC) bias which has been found to occur in 40-70% of individuals with delusions (Freeman et al., 2004). The cognitive model suggests that making hasty decisions without sufficient information may lead to beliefs related to threat being selected before enough data is gathered to evaluate alternative explanations. A review of the literature identified 12 studies investigating associations between JTC and PD, and found mixed results (De Rossi & Georgiades, 2022). Some evidence was found for higher levels of JTC in individuals with psychosis compared to healthy controls, although some studies found no differences. However, in support of the cognitive model, when individuals with psychosis were assessed in daily life using ESM, Lüdtke et al. (2017) found that those with a JTC bias had increased levels of future paranoia, but the JTC bias did not mediate the effect of negative affect on paranoia.

Another bias implicated in the model is the Bias Against Disconfirmatory Evidence (BADE). BADE refers to the tendency for individuals to look for evidence that is in-line with their beliefs and ideas, thus discarding evidence that opposes them (Freeman et al., 2002). For example, individuals may look for information that confirms the negative beliefs they hold about themselves as vulnerable, others as threatening or the world as dangerous. In general population adults, Bronstein et al. (2019) showed that the relationship between less analytic thinking and paranoia was mediated by a decreased ability to revise beliefs when presented with disconfirmatory evidence. However, when comparing paranoid patients with schizophrenia with non-paranoid patients, Sanford and Woodward (2017) found no differences in BADE.

Research has also shown significant positive associations between paranoia and externalising attributional bias (i.e., the tendency to blame others for negative events) in individuals with psychosis, with a small effect size (Murphy et al., 2018), and negative interpretation bias (i.e., the tendency to interpret uncertain information negatively) in both clinical and non-clinical populations, with medium

effect sizes (Trotta et al., 2020). Paranoia has also been associated with Theory of Mind (ToM) difficulties, which refers to difficulties reading the intentions of others. In a large-scale study with non-clinical adults, Raihani and Bell (2017) showed that paranoia increases the attribution of harmful intent in others, regardless of immediate threat to self.

Therefore, a wide range of cognitive biases have been associated with paranoia development and maintenance. The suggestion is that because individuals may be more likely to accept inaccurate explanations without weighing up or attending to the evidence for and against them, this increases the likelihood of paranoid interpretations. However, findings are mixed with regards to the strength of evidence and the evidence base is limited by the different approaches used to measure biases, thus limiting comparison.

The cognitive model suggests that individuals may understandably react to threat beliefs with defensive actions to protect themselves. However, this inadvertently reinforces the beliefs because it prevents access to and processing of disconfirmatory evidence (Freeman et al., 2002). Safety-seeking behaviours may include avoidance of feared places, hypervigilance to threat, leaving situations early, or attempts to conceal oneself (Freeman & Loe, 2023). In support of this, Gaynor et al. (2013) found that individuals with psychotic disorders who were currenting receiving treatment used more safety behaviours than individuals experiencing persistent psychotic experiences who did not need treatment. Specifically, 80-90% of those receiving treatment had engaged in safety behaviours in the previous month, compared to 61% in the persistence group. Further, greater use of safety behaviours was associated with higher levels of threat appraisals and distress, and threat appraisals mediated the relationship between safety behaviours and distress. Freeman and Loe (2023) found that defence behaviours positively predicted paranoia, with a large effect size. Further, using Structural Equation Modelling (SEM) it was found that 66.7% of variance in paranoia was explained by defence behaviours, negative images, negative self-beliefs, discrimination, dissociation, aberrant salience, anxiety sensitivity, agoraphobic distress, worry, less social support, agoraphobic avoidance, reduced analytical

reasoning and alcohol use. Importantly, defence behaviours were the most important predictor out of these factors. Given the cross-sectional nature of these studies, temporal judgements cannot be made, but recent longitudinal evidence by Berkhof et al. (2023) has offered some understanding. It was shown that VR-CBT led to significant reductions in safety behaviours which led to reductions in paranoia at both the 3-month and 6-month follow up. The evidence on this association in adults suggests that a large portion of individuals experiencing paranoia use safety behaviours and it is likely that safety behaviours maintain paranoia persistence. However, targeted support to reduce reliance on safety behaviours may have benefits for paranoia as individuals learn that they are indeed safe, and they can tolerate distress.

Sleep problems, such as insomnia, cause a range of mental health difficulties, but particularly high rates are found in individuals experiencing PD (Freeman et al., 2009). The cognitive model implies that sleep problems may cause paranoia, and one route it does this is through the impact on negative mood (Freeman & Garety, 2014). This is consistent with reliable findings in the evidence base suggesting that sleep problems predict paranoia over time, and this association is mediated by negative affect (Freeman et al., 2009; Lüdtke et al., 2023). Specifically, a large longitudinal study found that insomnia led to a threefold increase in future paranoia in general population adults (Freeman et al., 2012). The causal role of sleep on paranoia via negative affect has been confirmed by experimental evidence with non-clinical individuals (Reeve et al. 2018). Further, CBT for insomnia has been shown to significantly reduce insomnia for clinical groups experiencing delusions, with large effect sizes (Freeman et al., 2015b; Myers et al., 2011). Of importance, in a qualitative study, individuals with psychosis described how sleep problems caused them distress, fatigue and reduced their ability to engage in activities during the day. Worrying and psychotic experiences impacted on their sleep and the tiredness limited their ability to cope with voice hearing and PD (Waite et al., 2016). These findings suggest that sleep is a clear risk factor for paranoia and can exacerbate paranoia persistence through the negative impact on mood. Understanding factors leading to sleep difficulties may have benefits for reducing this risk.

1.3. Summary of the Adult Literature

Overall, the evidence base in adults shows that paranoia onset is predicted by multiple interrelated factors, which demonstrates the complexity of the paranoia experience. The adult literature suggests that anxiety/worry and negative self-beliefs are crucial predictors of paranoia development. There are mixed findings for anomalous experiences across the paranoia spectrum, which may reflect the ambiguity of these experiences which limits their conceptualisation and measurement in research (Lüdtke et al., 2023). A wide range of reasoning biases have been studied in adults, with unreliable results possibly due to high heterogeneity. However, the evidence suggests that reasoning biases, such as the JTC bias, are very much present in adults across the paranoia spectrum. Furthermore, safety behaviours and sleep are highly associated with paranoia and appear to precede onset and maintain persistence. The evidence regarding targeted interventions for sleep and safety behaviours provide promising results. Negative affect, more broadly, appears to play a key role in the development and maintenance of paranoia as well as the development and maintenance of many of the processes discussed, which is in-line with the cognitive model.

The adult literature is limited by cross-sectional evidence and high heterogeneity. More longitudinal and experimental studies are needed to determine temporal and causal influences. However, several useful systematic reviews and meta-analyses have been conducted to synthesise the results. The evidence base has been strengthened using ESM methodology which allows for examination of the processes as they occur in daily life, which suits the measurement of these dynamic experiences.

The cognitive model has deepened the understanding of adult paranoia, informed directions for research and allowed for the development of targeted interventions focussed on treating the causal factors (Freeman & Loe, 2023). There is now a need to extend and adapt what is known about paranoia in adults to children and adolescents (Freeman & Garety, 2014).

1.4. Paranoia in Childhood

As discussed in Chapter 1, adolescence is a sensitive period for the onset of mental health problems. Psychotic experiences are relatively common with evidence suggesting that the prevalence of psychotic symptoms in the general population is 17% for children aged 9-12 years and 7.5% for adolescents aged 13-18 years (Kelleher et al., 2012). Childhood psychotic experiences confer increased risk for a range of mental health presentations, including psychotic, affective, anxiety, behaviour and substance-use disorders (Healy et al., 2019).

In a large sample of general population adolescents, Bird et al. (2019) found that between 7-32% of adolescents reported weekly paranoid thoughts. Larger prevalence was found for females compared to males, and 42% of the sample scored in the clinical range for insomnia. Furthermore, 11% scored above the clinical threshold for negative affect. Comparably, in a clinical population of young people attending Child and Adolescent Mental Health Service (CAMHS), Bird et al. (2021) found that the rates of paranoia ranged from 14-54%, and likewise more females reported paranoia than males. In this clinical sample, paranoia was associated with greater psychological problems over time. For example, peer difficulties, self-harm, trauma, educational problems, anxiety and depression. Adding to this, in qualitative research, adolescents have described how paranoia has impacted on their mental health and social relationships and has led to isolation and loneliness (Bird et al., 2022). This is significant given that poor peer relationships are predictive of the persistence of mental health disorders after 3 years in children and adolescents (Ford et al., 2017). Yet despite its significance to adolescents themselves, paranoia was not recorded as a presenting problem in the young people's clinical notes, and most had not been offered support for this experience (Bird et al., 2022). Therefore, although paranoia is clearly highly relevant to young people, the lack of theoretical and empirical understanding about child and adolescent paranoia may have impeded clinical practice.

1.5. Aims

To our knowledge, there has not been a systematic review (SR) of the literature addressing the applicability of the cognitive model of PD to children and adolescents. To address this, the present SR aimed to evaluate the extent to which the cognitive model of PD, developed primarily for adults, applies to children and adolescents. Specifically, this review assessed studies from around the world reporting on self-report paranoia in children up to the age of 18 years old to examine whether associations have been found between paranoia and 1) worry/anxiety, 2) negative self-beliefs, 3) anomalous experiences, 4) sleep dysfunction, 5) reasoning bias, and 6) safety behaviours.

There is a need to evaluate key observations from paranoia in adults to adolescents to advance our understanding of PD across the lifespan. It is hoped that this review will provide valuable insights into whether an existing well-established model is appropriate for younger people, thereby informing future research seeking to adapt, develop and test child- and adolescent-specific theoretical models. Advancing the understanding childhood paranoia has implications for early identification, prevention and intervention for children and adolescents. By systematically reviewing the literature on possible causal and maintenance factors for adolescent paranoia, this review aims to fill a crucial gap and provide a foundation for future research and clinical practice.

2. Method

2.1. Search Strategy

The procedure followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidance (Page et al., 2021). Search terms were developed based on descriptions of the cognitive model of PD (Freeman et al., 2002; Freeman, 2007; Freeman, 2016). Literature searches were completed using three online databases: PsychInfo, Web of Science and PubMed in December 2023. The following restrictions were used when possible: ‘Peer Reviewed’, ‘English’ language, ‘Human’ population, and specific age filters. No date restrictions were used. Search terms were refined following a scoping search to gain a sense of the literature and following consultation

with the librarian at Royal Holloway, University of London. Only titles and abstracts were searched. The search syntax is detailed in Table 10. To identify any further eligible studies, hand searches of the reference lists of the included papers were conducted in February 2024.

Table 10

Search syntax

Database	Syntax
	PsychInfo
Paranoia	AB (paranoi* OR persecut* OR delus* OR delud* OR “threat belief*” OR suspicio* OR mistrust* OR “ideas of reference”)
	AB (child* OR adolescen* OR youth OR teen* OR “young person” NOT adult*)
Sample Process	AB (worry OR anxi* OR “negative self*” OR “negative schema*” OR inferior* OR “anomalous experience*” OR “anomalous internal” OR “perceptual anomal*” OR “unusual internal state” OR hallucinat* OR “racing thoughts” OR voice* OR “perceptual change*” OR “positive symptom*” OR “basic symptom*” OR “unusual experience*” OR “abnormal experience*” OR sleep* OR insomnia* OR hypersomnia* OR circadian* OR nightmare* OR “biased cogniti*” OR “cognitive bias*” OR “reasoning bias*” OR “belief inflexibility” OR “belief flexibility” OR “jumping to conclusions” OR JTC OR “theory of mind” OR “thinking bias*” OR “confirmation bias*” OR “safety behav*” OR “safety-seeking behav*” OR “defensive strateg*” OR avoid* OR “within-situation behav*”)
	Web of Science
Paranoia	((AB=(paranoi* OR persecut* OR delus* OR delud* OR “threat belief*” OR suspicio* OR mistrust* OR “ideas of reference”))
	AB=(child* OR adolescen* OR youth OR teen* OR “young person” NOT adult*))
Sample Process	AB=(worry OR anxi* OR “negative self*” OR “negative schema*” OR inferior* OR “anomalous experience*” OR “anomalous internal” OR “perceptual anomal*” OR “unusual internal state” OR hallucinat* OR “racing thoughts” OR voice* OR “perceptual change*” OR “positive symptom*” OR “basic symptom*” OR “unusual experience*” OR “abnormal experience*” OR sleep* OR insomnia* OR hypersomnia* OR circadian* OR nightmare* OR “biased cogniti*” OR “cognitive bias*” OR “reasoning bias*” OR “belief inflexibility” OR “belief flexibility” OR “jumping to conclusions” OR JTC OR “theory of mind” OR “thinking bias*” OR “confirmation bias*” OR “safety behav*” OR “safety-seeking behav*” OR “defensive strateg*” OR avoid* OR “within-situation behav*”)

Database	Syntax
	PubMed
Paranoia	((paranoi*[Title/Abstract] OR persecut*[Title/Abstract] OR delus*[Title/Abstract] OR delud*[Title/Abstract] OR "threat belief*"[Title/Abstract] OR suspicio*[Title/Abstract] OR mistrust*[Title/Abstract] OR "ideas of reference"[Title/Abstract])
	(child*[Title/Abstract] OR adolescen*[Title/Abstract] OR youth[Title/Abstract] OR teen*[Title/Abstract] OR "young person"[Title/Abstract] NOT adult*[Title/Abstract]))
Sample	(worry[Title/Abstract] OR anxi*[Title/Abstract] OR "negative self*"[Title/Abstract] OR "negative schema*"[Title/Abstract] OR inferior*[Title/Abstract] OR "anomalous experience*"[Title/Abstract] OR "anomalous internal"[Title/Abstract] OR "perceptual anomal*"[Title/Abstract] OR "unusual internal state"[Title/Abstract] OR hallucinat*[Title/Abstract] OR "racing thoughts"[Title/Abstract] OR
Process	voice*[Title/Abstract] OR "perceptual change*"[Title/Abstract] OR "positive symptom*"[Title/Abstract] OR "basic symptom*"[Title/Abstract] OR "unusual experience*"[Title/Abstract] OR "abnormal experience*"[Title/Abstract] OR sleep*[Title/Abstract] OR insomnia*[Title/Abstract] OR hypersomnia*[Title/Abstract] OR circadian*[Title/Abstract] OR nightmare*[Title/Abstract] OR "biased cogniti*"[Title/Abstract] OR "cognitive bias*"[Title/Abstract] OR "reasoning bias*"[Title/Abstract] OR "belief inflexibility"[Title/Abstract] OR "belief flexibility"[Title/Abstract] OR "jumping to conclusions"[Title/Abstract] OR JTC[Title/Abstract] OR "theory of mind"[Title/Abstract] OR "thinking bias*"[Title/Abstract] OR "confirmation bias*"[Title/Abstract] OR "safety behav*"[Title/Abstract] OR "safety-seeking behav*"[Title/Abstract] OR "defensive strateg*"[Title/Abstract] OR avoid*[Title/Abstract] OR "within-situation behav*"[Title/Abstract])

2.2. Eligibility Criteria

Studies were included based on the following a priori inclusion criteria:

1) Publication:
    a. Published in a peer-reviewed journal.
    b. Available in the English language.
    c. Available as full text.
2) Study design:
    a. Quantitative study design, including cross-sectional, longitudinal or experimental study designs that examine the association between paranoia and any of the following variables: 1) worry/anxiety, 2) negative self-beliefs, 3) internal anomalous experiences, 4) sleep disturbance, 5) reasoning biases, and 6) safety behaviours.
3) Participants:
    a. Child and adolescent sample only (≤18 years).
    b. If longitudinal data is collected, participants must be ≤18 years at follow-up.
    c. Either clinical or non-clinical (general population) populations.
4) Methodology:
    a. Reports on a standardised self-report measure or subscale of paranoia (including measures of mistrust, suspiciousness, ideas of reference and persecution, and persecutory delusions), in association with at least one of the following variables, measured with a self-report standardised measure or subscale:
        i. Worry or generalised anxiety (e.g., measures of anxiety that assess cognitive-related processes, not studies that assess co-morbid anxiety disorders, specific presentations of anxiety or situational anxiety).
        ii. Negative self-beliefs (e.g., self-esteem, self-schemas, self-concept, or self-worth)

iii. Internal anomalous experiences (e.g., hearing voices, hallucinations, perceptual distortions, or dissociation)
iv. Sleep disturbance (e.g., insomnia, hypersomnia, nightmares, or circadian rhythm disorder)
v. Reasoning biases (e.g., JTC, attributional bias, confirmation bias, belief inflexibility, or ToM dysfunction)
vi. Safety behaviours (e.g., avoidance, escape, or within-situation behaviours used to cope with anxiety or perceived threat)

Studies were excluded if they did not meet the above criteria.

2.3. Study Selection

All search results were exported to a BibTex file then uploaded to Rayyan, a reference management platform specifically designed for systematic literature reviews. Duplicates were subsequently removed.

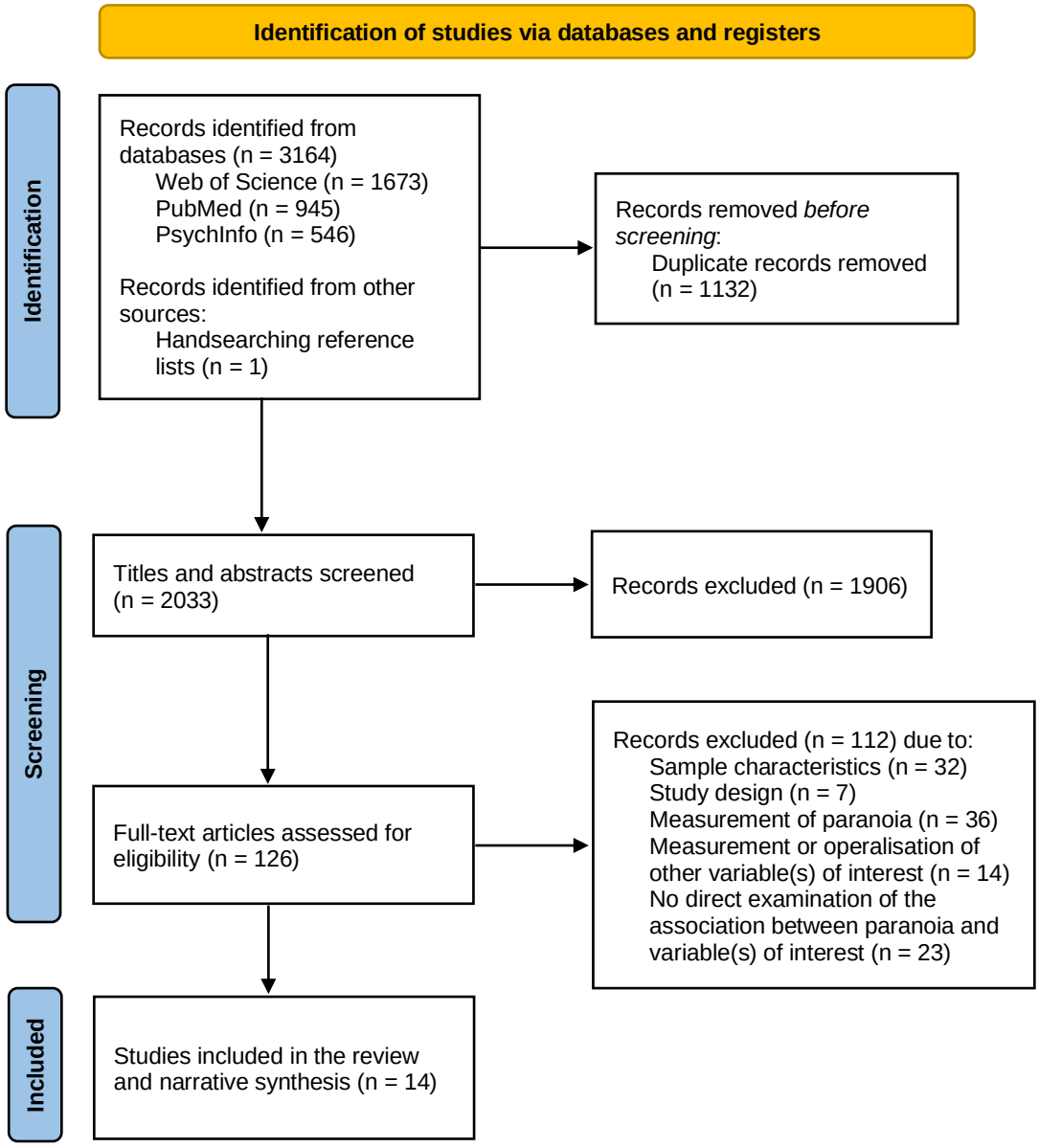
The primary reviewer (HT) screened all titles and abstracts of articles identified in the initial literature searches against the inclusion criteria and any papers that did not meet eligibility were excluded. Subsequently, the full texts of remaining papers were obtained and further reviewed for eligibility, with reasons for excluding articles recorded within Microsoft Excel. At this stage, one author was contacted to provide their full-text article which was ascertained.

The study selection process is illustrated in Figure 4. A total of 3,164 studies were retrieved from the databases. After duplicate studies were removed, the titles and abstracts of 2032 papers were reviewed against the eligibility criteria and 1906 papers were excluded due to not meeting the inclusion criteria. After further screening of the 126 remaining studies through reading the full texts, a further 112 were excluded with reasons listed in the PRISMA diagram. Fourteen studies were included in the final data synthesis.

An independent second reviewer (a trainee clinical psychologist) screened 10% of the original titles and abstracts (*n* = 203) and 10% of full-text papers (*n* = 13) against the eligibility criteria. The percentage agreement for title and abstract screening was 85% (kappa = 0.85), indicating a very good level of agreement between the raters. The percentage agreement for full-text screening was 70% (kappa = 0.70), indicating a good level of agreement (Dettori & Norvell, 2020). Discrepancies over inclusion and exclusion were discussed and resolved between the raters.

Figure 4

PRISMA diagram



2.4. Data Extraction

Data was extracted to a prepared spreadsheet using Microsoft Excel. The following data were extracted for each study, when available: a) publication details (first author, publication year, country); b) study design; c) sample characteristics (sample size, age range, mean age and standard deviation, clinical status, sampling method); d) measurement of paranoia; e) other variable(s) of interest and the instrument(s) used; f) analytic strategies; g) and main findings.

2.5. Quality Assessment

The Newcastle–Ottawa scale (NOS) is widely used to assess the quality of non-randomised studies (Moskalewicz & Oremus, 2020). There are several versions available, including an original version for cohort studies (Wells et al., 2000) and adapted versions which have been developed for cross-sectional studies (Herzog et al., 2013; Moskalewicz & Oremus, 2020; Ribeiro et al., 2020). An adapted version of the NOS for cross-sectional studies demonstrated moderate inter-rater reliability and has been shown to be a timely tool to complete (Moskalewicz & Oremus, 2020). The NOS was selected due to the observational nature of the included studies and to remain consistent with previous studies (Catalan et al., 2021; Fusar-Poli et al., 2017; Salazar de Pablo et al., 2023). Additionally, the NOS for cohort studies and adapted NOS for cross-sectional studies were selected for consistency and comparability.

Modified versions of the NOS for cohort and cross-sectional studies were used for the present review. Versions were adapted based on previous literature (Herzog et al., 2013; McPheeters et al., 2012; Ribeiro et al., 2020) and to increase applicability to the aims of the present review. For example, instead of zero, one point was assigned for self-reported outcomes because measuring paranoia involves subjective experiences, which may not be directly observable or easily quantifiable. The adapted NOS for cross-sectional studies contained 7 items and the adapted NOS for cohort studies contained 8 items. Both versions assess three domains, including selection, comparability and outcome. A point scoring system is used to assess study quality with the highest points indicating

highest quality. For the adapted NOS for cross-sectional studies, total scores ranged from 0 to 10. For the adapted NOS for cohort studies, total scores ranged from 0 to 11. Each study is given an overall quality rating of 'good' (indicating low risk of bias), 'fair' (indicating that the study is unlikely to have bias), or 'poor' (indicating that the study is likely to have bias).

The primary researcher quality assessed the 14 included studies. A second reviewer (a trainee clinical psychologist) independently quality assessed 35% of the included papers (*n* = 5) which were randomly selected by the primary researcher. The percentage agreement for quality assessment was 70% (kappa = 0.70), indicating a good level of agreement between raters (Dettori & Norvell, 2020). Discrepancies between reviewers were discussed and final ratings were agreed upon.

2.6. Data Synthesis

Due to high levels of clinical and methodological heterogeneity across studies, a meta-analysis was deemed to be inappropriate and unfeasible (Achana et al., 2014; Deeks et al., 2019; Ryan, 2016). This was due to differences in the samples used, measurements of paranoia and the associated key variables, and the statistical analysis procedures. Therefore, a narrative synthesis was used to summarise and report on findings from the included studies which followed guidance (Higgins et al., 2022; Page et al., 2021). Tabulated data provided information on study characteristics (see Table 11), results (see Table 12), and quality assessment (Table 13). The narrative synthesis was grouped according to the association between paranoia and the six variables of interest. The narrative synthesis also involved comparison of study characteristics and risk of bias. The narrative synthesis will infer whether the mechanisms involved in the development of paranoia in adults can be applied to children and adolescents.

3. Results

3.1. Study Characteristics

In total, 14 papers published between 2007 and 2024 met the inclusion criteria (see Table 11). Ten papers were conducted in the UK (71.42%), 1 paper was conducted in the UK and Hong Kong (7.14%), 1 paper in China (7.14%), 1 in Germany (7.14%) and 1 in Italy (7.14%). The studies were mostly cross-sectional (*n* = 10; 71.42%), 1 paper was both cross-sectional and longitudinal (7.14%), 2 further papers were longitudinal only (14.29%) and 1 study used ESM over 7 days (7.14%). The follow-up period for the 3 longitudinal papers ranged from 6-weeks to 7 months. A variety of sampling methods were used including consecutive, opportunity, convenience, quota, cluster and random sampling. Methods of data analysis included correlations (e.g., Pearson's, Spearman's or phenotypic correlations), regression analysis, and moderator and mediator analysis which employed structural equation modelling (SEM) or Bayesian networks. Papers predominantly collected self-report data via online survey platforms or paper and pen evaluations.

3.2. Sample Characteristics

The 14 studies together represented a total sample of 11,433 children and adolescents (see Table 11). The average sample size across studies was 817, with samples ranging between 34 and 4800 participants. Participants aged ranged from 8 to 18 years. One paper did not report on gender demographics, but for the 13 that that did, most were majority female (*n* = 10). Seven papers did not report data on ethnicity and this data was not included in the data extraction process. Samples were drawn from clinical and general populations. Participants were mostly recruited from schools, CAMHS and general community populations. Three papers used clinical samples, which included help-seeking individuals with psychotic-like experiences (PLEs), self-reported unusual experiences and associated distress (UEDs) and individuals reporting paranoid ideation. One paper compared a clinical sample of young people diagnosed with a psychotic episode with healthy controls.

Table 11

Study Characteristics

First author (Year), Country	Study Design	Sample characteristics			
		Sample size (*N*)	% Female	Age range (M, SD)	Population
Bird et al. (2019), UK	Cross-sectional	801	51%	11-15 M = 13.3, SD = 1.16	Non-clinical, school cohort
Bird et al. (2017), UK	Longitudinal	34	82%	11-16 M = 14.9, SD = 1.25	Clinical, CAMHS
Campbell et al. (2007), UK	Cross-sectional	373	[a]56.5%	14-16 M = 14.8, SD = 0.7	Non-clinical, school cohort
Catone et al. (2017), Italy	Cross-sectional	50	52%	12-18 [a]M = 14.17, SD = 1.53	Clinical, CAMHS
Galbraith et al. (2014a), UK	Cross-sectional	392	[a]80%	11-16 M = 13.03, SD = 1.41	Non-clinical, school cohort
Gin et al. (2021), UK	Cross-sectional	122	76.2%	12-18 M = 14.81, SD = 1.62	Clinical, CAMHS
Hennig et al. (2018), Germany	ESM	61	[a]49.18%	14-17 M = 15.1, SD = 1.1	Non-clinical, general community
Hollowell et al. (2020), UK	Cross-sectional	69	55%	Range NR M = 16.75, SD = 0.55	Non-clinical, school cohort
Kingston et al. (2022), UK	a. Cross-sectional	a. 296	a. 53.2%	14-16	Non-clinical, school cohort

First author (Year), Country	Study Design	Sample characteristics			
		Sample size (*N*)	% Female	Age range (M, SD)	Population
	b. Longitudinal	b. 133	b. 52.6%	a. M = 14.48, SD = 0.53 b. M = 14.93, SD = 0.41	
Korver-Nieberg et al. (2013), UK	Cross-sectional, case-control	110 a. 32 patients b. 78 controls	a. 39% b. 35.9%	13-18 a. M = 17.1, SD = 1.3 b. M = 16.3, SD = 1.6	Clinical, early psychosis, vs non-clinical, general community
Schönig et al. (2024), UK	Cross-sectional	142	78%	14-17 M = 15.40, SD = 1.09	Non-clinical, general community
Taylor et al. (2015), UK	Cross-sectional	4800	55%	16 M and SD NR	Non-clinical, general community
Wong et al. (2014), UK and Hong Kong	Cross-sectional	1086 (UK) 1470 (Hong Kong)	NR	8-14 M = 11.28, SD = 1.63 (UK) M = 11.46, SD = 1.68 (Hong Kong)	Non-clinical, school cohort
Wu et al. (2021), China	Longitudinal	1627	46.6%	12-13 M = 12.7, SD = 0.6	Non-clinical, school cohort

Note. [a]Calculated based on information in full-text article.

Key. M = Mean, SD = Standard Deviation, UK = United Kingdom, CAMHS = Child and Adolescent Mental Health Services; NR = Not Reported

3.3. Quality Assessment

The adapted NOS for cross-sectional studies was used to assess 10 of the included studies, and the adapted NOS for cohort studies was used to assess 4 of the studies. As the tools were adapted for applicability to the present SR, studies that scored 0-4 total points were considered poor quality for both tools, 5-6 and 5-7 points were considered fair quality, and 7-10 and 8-11 total points were considered good quality, for the NOS cross-sectional and NOS cohort tool, respectively. The quality assessment and overall rating for each study can be found in Table 13.

Most studies were rated as being of 'fair' quality (*n* = 7), 6 studies achieved a 'good' rating and 1 study was rated 'poor'. Studies of higher quality used larger, more representative samples. They also described attrition rates or non-respondents and controlled for possible confounding factors in the analysis. For example, age, gender, bullying, cognitive ability and baseline outcome measurements when assessed longitudinally. Studies of lower quality utilised convenience sampling and only recruited from one source, indicating risk of sampling bias and impacting on the generalisability of the findings. For longitudinal studies the follow-up periods were relatively short (i.e., under 2 months) which may have limited the ability to detect changes in paranoia. Overall, most studies did not report on prespecified power calculations.

It should be noted that the study rated as 'poor' utilised ESM which had low applicability to the quality assessment tool used. Therefore, the rating for this study likely underscores the methodological rigour of this approach. For example, the study had to adapt standardised self-report measures to suit ESM, but they also used objective actigraphy measurement which improved the accuracy and precision of their measurements. Further, although the follow-up period was deemed too short for outcomes to occur on the tool, participants completed 4-daily measures over a period of 7 days and nights. Therefore, the methodology allowed for in-depth, reliable and valid measurements. Despite these strengths, the study was likely impacted by sampling bias due to their recruitment strategy and they did not describe participants' baseline measurements.

3.4. Main Findings

Studies varied in their measurement of paranoia (see Table 12). Overall, 8 different tools were used. The most used tool was the paranoia subscale of the Specific Psychotic Experiences Questionnaire (SPEQ; Ronald et al., 2014) (*n* = 4) as most studies focussed on examining a range of psychotic experiences, rather than focussing on paranoia alone. Other subscales of paranoia utilised were from the Unusual Experiences Questionnaire (UEQ; Laurens et al., 2012) (*n* = 1), the Community Assessment of Psychic Experiences (CAPE; Galbraith et al., 2014a) (*n* = 1) and Mental Health Inventory of Middle school students (MMHI-60; Wang, 1997) (*n* = 1). Direct measures of paranoia were heterogenous, including the original and revised Green et al. Paranoid Thoughts Scale (GPTS; R-GPTS; Green et al., 2008; Freeman et al., 2019) (*n* = 3), Bird Checklist of Adolescent Paranoia (B-CAP; Bird et al., 2020) (*n* = 2), and Paranoia Scale (PS; Fenigstein & Vanable, 1992) (*n* = 1). One paper developed a measure of childhood mistrust, the Social Mistrust Scale (SMS; Wong et al., 2014), to assess attenuated experiences of paranoia. The range of measures used limits comparability across findings.

Most studies examined more than one predictor variable of interest (*n* = 8). The relationship between paranoia and negative self-beliefs in children and adolescents was most frequently investigated, with 7 papers examining this relationship. Six studies looked at the relationship between paranoia and internal anomalous experiences, 5 looked at paranoia and reasoning biases and 5 focused on the relationship between paranoia and worry/anxiety. Four studies examined the association between paranoia and sleep disturbances. The relationship between paranoia and safety behaviours has been researched the least, with only 2 studies examining this relationship. The findings are described below with respect to each relationship.

3.4.1. Worry/Anxiety (n = 5)

Three studies provided correlational evidence of a significant positive association between anxiety and paranoia (Galbraith et al., 2014a; Schönig et al., 2024, Wu et al., 2021), with similarly high effect

sizes (r = 0.61; ρ = 0.59). These studies demonstrate that higher levels of anxiety are strongly associated with higher levels of paranoia in general population adolescents.

One longitudinal study investigated both worry and anxiety in a clinical sample of adolescents. Bird et al. (2017) demonstrated significant positive associations between worry and baseline paranoia (r = 0.34) and worry and paranoia at a 3-month follow up (r = 0.47), with medium effect sizes. However, when baseline paranoia severity was controlled for, the medium association remained (r = 0.34) but was no longer significant. A significant positive association was also found between anxiety and baseline paranoia (r = 0.56) and follow-up paranoia (r = 0.52), with large effect sizes. Likewise, the follow-up association was no longer significant after controlling for baseline paranoia, and the effect size reduced to small (r = 0.23). The insignificant findings when controlling for baseline paranoia were likely due to lack of statistical power to detect effects because of the small sample size (n = 34). These findings suggest that the relationship between increased anxiety and worry on paranoia persistence may depend on baseline paranoia levels. The validity of the findings may also be limited by treatment effects as participants were receiving support from CAMHS, including psychological therapy and medication.

Two studies examined the mediating effects of anxiety/worry on paranoia in school cohorts of adolescents. Galbraith et al. (2014a) examined whether hallucinations were associated with paranoia through several mediators including, anxiety, negative self-beliefs, positive self-beliefs, negative other-beliefs, positive other-beliefs, and social functioning. In this model, anxiety emerged as a significant mediator. The findings show that anxiety may explain the relationship between hallucinations and paranoia. However, since mediation involves temporal sequences, the study is limited by its cross-sectional design and temporal pathways cannot be assumed. A more robust study was conducted by Kingston et al. (2022) where associations between paranoia and well-being via worry, self-esteem and non-judgemental awareness, were examined over time. It was found that baseline paranoia significantly positively predicted 2-week worry, and 2-week worry significantly negatively predicted 6-

week well-being. Further, 2-week worry significantly mediated the relationship between baseline paranoia and 6-week well-being. In the model, worry explained a substantial portion of the variance (43%) between paranoia and well-being. These relationships were also reverse tested with worry predicting well-being via paranoia. No significant direct or indirect effects were found in this model, but worry did significantly positively predict paranoia. These findings suggest a bi-directional relationship between paranoia and worry.

Wu et al. (2021) provided longitudinal evidence of the association between paranoia and anxiety in a large sample of Chinese general population adolescents. They investigated the associations before the COVID-19 pandemic and 7-months later after lockdowns. Changes in paranoia over time were significantly associated with changes in anxiety across the spectrum, including adolescents with no PLEs, remitted PLEs, new PLEs and persistent PLEs. Importantly, adolescents newly experiencing paranoia had more severe increases in anxiety. These findings suggest that as paranoia increases over time, anxiety increases with it. However, given it is well-established that the pandemic increased anxiety across young people (Marques de Miranda et al., 2020), and the study did not control for baseline measurements, cause and effect cannot be established.

Together, these findings suggest that both worry and anxiety are associated with adolescent paranoia across the spectrum. Only one study identified provided understanding about the directionality of this association. It suggested that higher levels of paranoia may predict future levels of increased worry, and higher levels of worry may predict future levels of high paranoia (Kingston et al., 2022).

3.4.2. Negative Self-Beliefs (n = 7)

Studies varied in the conceptualisation and therefore measurement of negative self-beliefs. Studies used scales assessing negative self-beliefs (Bird et al., 2017; Galbraith et al., 2014a; Gin et al., 2021), self-esteem (Bird et al., 2017; Kingston et al., 2022; Wong et al., 2014), academic and social competence (Bird et al., 2017), negative self-comparison on social media (Bird et al., 2019) and

negative posttraumatic self-beliefs (Campbell & Morrison, 2007). The heterogeneity makes comparisons across studies challenging.

With regards to associations between paranoia and negative self-beliefs, cross-sectional findings suggest significant positive associations with large effect sizes (r = 0.51 to 0.55) in both clinical (Bird et al., 2017) and non-clinical (Galbraith et al., 2014a) adolescent populations. When assessed longitudinally, Bird et al. (2017) found that negative self-beliefs were significantly associated with 3-month paranoia, with a large effect size (r = 0.57). However, after controlling for baseline paranoia severity the association reduced to small (r = 0.34) and was no longer significant, suggesting the relationship was contingent on baseline paranoia scores. As described in the section above, Galbraith et al. (2014a) investigated the mediating effect of negative self-beliefs on the relationship between hallucinations and paranoia. The results showed that negative self-beliefs did not emerge as a significant mediator in this relationship, but negative-other beliefs did. Using data from a Randomised Controlled Trial (RCT), Gin et al. (2021) showed that, together, the JTC bias, affect, negative life events and self- and other- schemas explained 40% of the variance in paranoia. Negative-self beliefs significantly contributed to paranoia, when controlling for gender and ethnicity, suggesting that negative self-beliefs were particularly relevant to paranoia in a diverse sample of clinical population adolescents. These results suggest that increased negative self-beliefs are associated with increased paranoia, but no longitudinal evidence is available.

Cross-sectionally, Wong et al. (2014) investigated mistrust in general population children from the UK and Hong Kong. The study found moderate negative associations between overall mistrust and self-esteem in the UK (r = -0.37) and Hong Kong (r = -0.42). These findings were consistent across home and school contexts in both samples. To examine these associations further, participants were split into groups which represented the top and bottom 15% of scores on the mistrust and self-esteem scales to examine group differences. These findings showed that ‘mistrustful’ children were significantly more likely to display lower levels of self-esteem for both UK and Hong Kong populations.

When controlling for socioeconomic (SES) status and verbal ability, SES emerged as a significant predictor in UK children, but verbal ability did not. In Hong Kong, neither confounding variables were significant predictors. Longitudinal analyses (Bird et al., 2017), found moderate negative associations between paranoia and self-esteem at baseline (r = -0.46) and follow-up (r = -0.43), but this effect reduced and did not reach significance when adjusting for baseline paranoia severity (r = -0.18). In the longitudinal mediation analyses by Kingston et al. (2022), as described above, baseline paranoia significantly negatively predicted 2-week self-esteem, and 2-week self-esteem significantly positively predicted 6-week well-being. Self-esteem also independently mediated the relationship between paranoia and well-being and explained 55% of the variance. Importantly, when self-esteem, worry and non-judgemental awareness were included simultaneously in the model, only self-esteem emerged as a significant mediator, indicating that self-esteem may play an important role in this relationship, above that of worry and non-judgemental awareness. Moreover, when reverse tested, self-esteem significantly negatively predicted paranoia, and although an indirect effect for self-esteem on well-being was found, the direct effect was not significant. These results indicate that low self-esteem is associated with higher levels of paranoia across a diverse range of populations. Furthermore, although the relationship between the two may be bi-directional, there is stronger evidence for increases in paranoia preceding low self-esteem.

Bird et al. (2017) found no significant associations between self-perceived academic and social competence at baseline or follow-up, suggesting that these aspects of self-beliefs may not be relevant to adolescent paranoia. Campbell and Morrison (2007) found a strong positive association between paranoia and negative self-beliefs following experiences of bullying in a non-clinical school cohort (r = 0.62). Further, in regression analyses, negative self-beliefs predicted paranoia, even when controlling for extent of bullying. This study highlights the role that negative social experiences, such as bullying, can have on self-beliefs and paranoia in adolescence. Lastly, findings by Bird et al. (2019) showed that paranoia and negative self-beliefs resulting from comparison to others on social media were highly related in non-clinical adolescents (r = 0.59). Though cross-sectional data were used, they used

Bayesian methods with DAGs to understand potential causal relationships. Using this approach, they found that negative self-comparisons significantly contributed to feelings of paranoia, more so than paranoia contributed to self-comparison. Negative self-comparisons also continued to predict paranoia once the contribution of other emotional, cognitive and social variables was controlled for, further supporting their causal claims.

These findings demonstrate the significance of negative self-concept in understanding adolescent paranoia. They also highlight the potential negative impact of social factors and social contexts on adolescent self-beliefs and paranoia.

3.4.3. Internal Anomalous Experiences (n = 6)

Four studies reported on hallucinatory experiences in adolescence, 3 of which were cross-sectional. The evidence suggested that hallucinations and paranoia were significantly positively associated in both clinical (Catone et al., 2017) and non-clinical populations (Campbell & Morrison, 2007), with medium effect sizes (r = 0.30 to 0.40). Galbraith et al. (2014a) showed that whilst hallucinations were significantly associated with paranoia in non-clinical children and adolescents, this association was no longer significant when schemas, anxiety, and social functioning were included as mediators. This indicated full mediation whereby the effect of hallucinations on paranoia operates entirely through these variables, and particularly via anxiety and negative-other beliefs. In the only longitudinal study of this association, Bird et al. (2017) found a strong positive association between hallucinations and paranoia at baseline (r = 0.54) and a moderate association with follow-up paranoia (r = 0.39), but the association at follow-up was not significant after controlling for initial paranoia severity. Therefore, although higher levels of hallucinatory experiences may be associated with higher paranoia, there is weak longitudinal evidence for the association, above and beyond the effects of previous paranoia scores.

Three studies reported on the relationship between dissociation and paranoia in adolescence. Although Campbell and Morrison (2007) found a positive association with a large effect size (r = 0.61)

in a non-clinical sample, more recently Gin et al. (2021) found that dissociation did not independently predict paranoia in a clinical sample. Rather, other variables were more important in understanding adolescent paranoia, most notably negative self and other beliefs. Furthermore, an ESM study by Hennig and Lincoln (2018) sought to examine whether dissociation mediated the relationship between sleep and paranoia, but no effects were found. However, dissociation was rarely reported in the sample, possibly because the study utilised a non-clinical sample. Nevertheless, although longitudinal evidence is needed, the available literature suggests weak evidence for the role of dissociation in understanding paranoia.

3.4.4. Sleep (n = 4)

The association between paranoia and sleep difficulties in adolescence has been assessed using a range of methodologies. In Bird et al.'s (2017) small-scale longitudinal study, a moderate positive association was found between insomnia and baseline paranoia (r = 0.37) and a strong positive association was found with follow-up paranoia (r = 0.51), which remained significant after baseline adjustment. Further, when causal pathways were explored cross-sectionally by Bird et al. (2019), moderate positive associations were found between paranoia and sleep difficulties (r = 0.45) and insomnia (r = 0.48), and the DAGs were suggestive of a pathway between sleep difficulties and paranoia via negative affect. A cross-sectional study by Taylor et al. (2015) investigated the genetic and environmental influences on the association between paranoia and sleep disturbances in a very large sample of 16-year-old twin pairs. Paranoia showed a moderate positive association with sleep disturbances, and although the association reduced to small when negative affect was controlled for, it remained significant. Additionally, using SEM, they showed that the relationship between sleep difficulties and paranoia were, in part, due to genetic and environmental influences, but genetic influences explained more of the variance. Furthermore, their findings indicated that some of the environmental and genetic associations between paranoia and sleep could be explained by the presence of negative affect. Longitudinally, Hennig and Lincoln (2018) measured sleep using actigraphy

objective measures and subjective ESM measures. Both objective and subjective total sleep time, as well as dreaming frequency, predicted paranoid thinking in the morning with a small effect size. However, the effect of sleep on paranoia was short-term as no effects were found on paranoia in the afternoon. Additionally, no effects were found on paranoia for fragmented or interrupted sleep. They found some evidence that paranoia may predict sleep difficulties, but stronger evidence for sleep difficulties preceding paranoia. Importantly, they also found evidence of mediating effects of positive and negative affect between total sleeping time and paranoia. Taken together, these findings indicate that difficulties with sleep may lead to increased paranoia thinking, through the impact on affect. This emphasises the central role that affect may play in this relationship.

3.4.5. Reasoning biases (n = 5)

The JTC bias has been the most researched reasoning bias with adolescents and has been studied through the 'Beads Task' (Garety et al., 2005). In this paradigm, participants are shown two jars with different coloured beads in them. They can request as many beads from an unknown jar as they would like and must decide which jar the beads are being drawn from. The idea is that individuals with a JTC bias tend to make decisions quickly, after fewer beads have been drawn. Bird et al. (2017) did not find any evidence of the JTC bias in the clinical sample. However, it should be noted that the sample only consisted of 34 young people. When assessed cross-sectionally, Gin et al. (2021) found that having a JTC bias did not significantly predict paranoia in a clinical sample of adolescents. Although the sample size was larger than that of Bird et al. (2017), a JTC bias was only found in a small percentage of the clinical sample. Therefore, this may have limited the statistical power of the study to detect any effects. With a large sample of non-clinical adolescents, Galbraith et al. (2014a) investigated whether the JTC bias moderated the relationship between anxiety and paranoia. However, they did not find any evidence to suggest that adolescents who were highly anxious and in the JTC group scored higher on measures of paranoia.

In the only case-control study included in the SR, Korver-Nieberg et al. (2013) used a perspective-taking task to understand whether ToM is already reduced in 32 adolescents presenting with early psychosis, compared to 78 healthy controls. Overall, they did not find an association between number of perspective-taking errors and paranoia in the patient or control groups, suggesting that ToM is not impaired in early psychosis.

Hollowell and Ronald (2020) examined whether greater BADE is associated with paranoia in a non-clinical sample of 69 adolescents. They used a computer-based paradigm to display sets of statements that gradually clarified an ambiguous scenario. Participants had to rate how plausible several interpretations of the statements were, based off the information they had at the time. The interpretations included one that was clearly unlikely, one that made the most sense once all statements were shown, and two that seemed likely at first but became less plausible with more information. However, no association was found between paranoia and BADE.

The studies included provide little evidence of a relationship between various reasoning biases and paranoia in adolescence. However, the limited evidence that is available is limited by small sample sizes.

3.4.6. Safety Behaviours (n = 2)

Only two papers were found that assessed safety behaviours, both of which were cross-sectional and used non-clinical samples. Schönig et al. (2024) found that paranoia positively predicted safety behaviour use, with a large effect (β = 0.50). Further Bird et al. (2019) examined the relationship between paranoia and online safety behaviours, for example, actions taken by adolescents to avoid threats while using social media. A strong direct effect between paranoia and online safety behaviours were found, even when controlling for the other variables. Further, the findings suggested that paranoia contributed to online safety behaviours more than online safety behaviours contributed to paranoia. Although a temporal sequence cannot be confirmed, these findings indicate that feelings of paranoia may lead to increased use of safety behaviours in adolescents.

Table 12

Study Results

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
Bird et al. (2019)	B-CAP	1. Negative self-beliefs (BSMAS – social media (SM) negative self-comparison)	1. Large positive association (r = 0.59, p < 0.001)	Variables included in DAG model: negative affect, bullying, peer difficulties, body image, sleep, SM self-comparison, SM emotions, SM safety behaviours, SM addiction and SM night use. Causal pathways: 1. SM self-comparison → paranoia: 62% (z = 0.38, CI [0.10-0.67]). DE: 73% (z = 0.16, CI [0.00-0.40]). Paranoia → SM self-comparison: 37% (z = 0.36, CI [0.07-0.61]). DE: 72% (z = 0.17, CI [0.00-0.45])
		2. Safety-seeing behaviours (BSMAS - social media safety-seeking behaviours)	2. Large positive association (r = 0.65, p < 0.001)	
		3. Sleep difficulties (ASWS)	3. Medium positive association (r = 0.45, p < 0.001)	
		4. Insomnia (ISI)	4. Medium positive association (r = 0.48, p < 0.001)	

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
				2. SM safety behaviours → paranoia: 40% (*z* = 0.39, CI [0.19-0.67]). DE: 100% (*z* = 0.26, CI [0.16-0.44]) Paranoia → SM safety behaviours: 60% (*z* = 0.37, CI [0.19-0.63]). DE: 100% (*z* = 0.26, CI [0.17-0.41]) 3. Sleep → paranoia: 23% (*z* = 0.16, CI [0.00-0.46]) DE: 38% (*z* = 0.03, CI [0.00-0.10]). Paranoia → sleep: 47% (*z* = 0.25, CI [0.00-0.48]). DE: 21% (*z* = 0.02, CI [0.00-0.13]). Mediated by negative affect.
Bird et al. (2017)	GPTS, Part B	1. Worry (PSWQ-C)	1. Medium positive association at BL (*r* = 0.34, *p* < 0.048) and FU (*r* = 0.47, *p* < 0.006). FU not significant after controlling BL paranoia (*r* = 0.34, *p* < 0.057)	N/A

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
		2. Anxiety (RCADS – Anxiety Total)	2. Large positive association at BL (r = 0.56, $p < 0.001$) and FU (r = 0.52, p = 0.002). FU not significant after BL paranoia controlled (r = 0.23, p = 0.207)	
		3. Negative self-beliefs (BCSS – Negative-Self subscale)	3. Large positive association at BL (r = 0.51, $p < 0.002$) and FU (r = 0.57, $p <$ 0.001). FU not significant after BL paranoia controlled (r = 0.34, $p <$ 0.059)	
		4. Self-esteem (RSES)	4. Medium negative association at BL (r = -0.46, p = 0.007) and FU (r = -0.43, p = 0.012). FU not significant after BL paranoia controlled (r = -0.18, p = 0.326)	

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
		5. Self-concept (SPP – Academic and Social Competence subscales)	5. Not significantly associated at BL (r = -0.17, p = 0.328; r = 0.09, p = 0.454) or FU (r = -0.20, p = 0.277; r = 0.12, p = 0.364), respectively.	
		6. Perceptual anomalies (SPEQ – Hallucinations subscale)	6. Large positive association at BL (r = 0.54, p < 0.001), medium positive association at FU (r = 0.39, p = 0.026). FU not significant after BL paranoia controlled (r = 0.01, p = 0.954)	
		7. JTC bias (beads task)	7. No evidence in sample	
		8. Insomnia (ISI)	8. Medium positive association at BL (r = 0.37, p = 0.033), large positive association at FU (r = 0.51, p = 0.003). FU remained significant after BL paranoia controlled (r = 0.38, p = 0.035)	

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
Campbell et al. (2007)	PS	1. Negative posttraumatic self-beliefs (PTCI – Negative Self subscale) 2. Hallucinations (LSHS-R – Auditory subscale) 3. Dissociation (DES)	1. Large positive association (r = 0.62, p < 0.01) 2. Medium positive association (r = 0.40, p < 0.01) 3. Large positive association (r = 0.61, p < 0.01)	Regression analysis: 1. Negative posttraumatic self-beliefs significantly predicted paranoia (B = 0.33, Partial r = 0.30, T = 5.998, p < 0.005). Remained significant after controlling for bullying (B = 0.308, partial r = 0.298, T = 5.866, p < 0.001)
Catone et al. (2017)	SPEQ – Paranoia subscale	Hallucinations (SPEQ – Hallucinations subscale)	Moderate positive association (r = 0.30, p < 0.05)	N/A
Galbraith et al. (2014a)	CAPE – Paranoia subscale	1. Anxiety (DASS-21 – Anxiety subscale) 2. Negative self-beliefs (BCSS – Negative Self subscale)	1. Large positive association (r = 0.61, p = 0.01) 2. Large positive association (r = 0.55, p = 0.01)	Mediator analysis: hallucinations → paranoia: significant DE (b = 0.33; SE = 0.093; t = 3.56; p < 0.001). No longer significant when schemas, anxiety, and social functioning

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
		3. Hallucinations (CAPE – Hallucinations subscale) 4. JTC bias (beads task)	3. Medium positive association (*r* = 0.35, *p* = 0.01)	entered (*b* = 0.06; SE = 0.07; *t* = 0.74; *p* = 0.459). IE: hallucinations → anxiety → paranoia (*b* = 0.14; SE = 0.05); hallucinations → negative-other beliefs → paranoia (*b* = 0.05, SE, 0.03) Moderator analysis: Anxiety → paranoia not moderated by JTC (*b* = −0.14; *t* = −1.70; *p* = 0.091; CI [−0.308, 0.023]). Hallucinations → paranoia not moderated by age (*b* = −0.03; *t* = −0.53; *p* = 0.598; CI [−0.161, 0.093) and sex (*b* = 0.27; *t* = 1.37; *p* = 0.171; CI [−0.116, 0.653]).
Gin et al. (2021)	UEQ – Paranoia	1. Negative self-beliefs (BCSS – Negative-Self subscale)	NR	Regression analyses:

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
		2. JTC bias (beads task) 3. Dissociation (A-DES)		JTC bias, affect, negative life events and schemas explained 40% of variance, $F(10,106) = 7.29$, $p < .005$, $r2 = 0.40$. Negative-self beliefs significantly contributed to paranoia ($B = -0.135$, SE = 0.033, $p < .001$). JTC bias ($B = -0.053$, SE = 0.220, $p = .081$) and dissociation ($B = -0.025$, SE = 0.035, $p = 0.481$) did not.
Hennig et al. (2018)	SPEQ – Paranoia subscale (adapted for experience sampling)	1. Sleep (objective measures: TST, wake after sleep onset, sleep efficiency; subjective measures: TST, nocturnal awakenings, feeling rested, dreaming frequency)	NR	Regression analyses: Objective TST ($b = -0.93$, SE = 0.26, $p < 0.01$, CI [−1.46, −0.42]) and subjective TST ($b = -0.64$, SE = 0.26, $p = 0.02$, CI [−1.16, −0.07]) and dreaming frequency ($b = 1.40$, SE = 0.61, $p = 0.02$, CI [0.24, 2.64]) significantly predicted morning paranoia. No significant predictors of paranoia in

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
		2. Dissociation (A-DES - adapted for experience sampling)		afternoon. Paranoia did not significantly predict sleep. Sleep did not significantly predict dissociation. Mediator analyses: Sleep → paranoia not mediated by dissociation and inattention. Objective/subjective TST → affect → paranoia
Hollowell et al. (2020)	SPEQ – Paranoia subscale	BADE (computer-based paradigm)	NR	Regression analyses: Paranoia and hallucinations explained 10% of variance in BADE (R^2 = 0.10, F(2,66) = 3.84, p = 0.026). Hallucinations only significant predictor of BADE. No significant association between paranoia and BADE (R^2 = 0.004, F(1,67) = 0.260, p = 0.612)
Kingston et al. (2022)	B-CAP	1. Worry (PSWQ-C)	NR	Mediator analyses:

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
		2. Self-esteem (RSES)		T1 paranoia → T2 worry → T3 well-being, $F(2,74) = 11.52$, $R^2 = 0.248$, $p<0.001$ T1 paranoia → T2 self-esteem → T3 well-being, $F(2,74) = 48.00$, $R^2 = 0.565$, $p<0.001$. T1 paranoia → T2 self-esteem (β = -0.37, SE = 1.41, $t = -3.48$, $p<0.001$) T1 paranoia → T2 worry (β = 0.60, SE = 2.15, $t = 6.36$, $p<0.001$) T2 Self-esteem → T3 well-being (β = 0.65, SE = 0.17, $t = 7.91$, p<0.001) T2 worry → T3 well-being (β = -0.25, SE = 0.16, $t = -2.36$, $p = 0.021$) IE accounted for 43% (worry) and 55% (self-esteem) of total effect.

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
Korver-Nieberg et al. (2013)	GPTS	ToM (PTT)	No association between number of perspective-taking errors and paranoia in patient or control group.	N/A
Schönig et al. (2024)	R-GPTS	1. Anxiety (DASS-21 – Anxiety subscale) 2. Safety-seeking behaviours (MSB)	1. Large positive association (*r* =0.61, *p*<0.001) 2. NR	APIM: Paranoia positively predicted safety behaviour use (*b* = 1.13, β = 0.50, SE = 0.18, *p* < 0.001) Anxiety did not predict safety behaviour use (*b* = 0.72, β = 0.12, SE = 0.37, *p* = 0.16)
Taylor et al. (2015)	SPEQ – Paranoia subscale	Sleep (PSQI and ISI)	Medium significant association for both (*r*ph = 0.36, CI [0.33, 0.38]). Remained significant after negative affect controlled (*r* = 0.16-0.17). Cross-trait cross-twin correlations: Small correlation between paranoia and PSQI for MZ twins (*r* = 0.26, CI [0.22, 0.31]) and DZ twins (*r* = 0.13, CI [0.12, 0.18]). Small correlation between	SEM: 51% variance due to additive genetic influences, 49% due to non-shared environment. Additive genetic influences explained 52% of covariance between paranoia and PSQI and 55% between paranoia and ISI, 22% and 19% due to nonshared

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
			paranoia and ISI for MZ twins (*r* = 0.23, CI [0.22, 0.28]) and DZ twins (*r* = 0.14, CI [0.13, 0.19])	environmental influences, respectively. Hereditability explained 67% of covariance between paranoia and PSQI and 71% between paranoia and ISI, with 33% and 29% being due to environmental influences respectively. Paranoia → negative affect → sleep.
Wong et al. (2014)	SMS	RSES	UK: Total mistrust and RSES, medium negative association (*r* = -0.37, *p* < 0.01). Medium negative associations between RSES and home mistrust (*r* = -0.36, *p* < 0.01), school mistrust (*r* = -0.36, *p* < 0.01) and general mistrust (*r* = -0.40, *p* < 0.01) HK: Total mistrust and RSES, medium negative association (*r* = -0.42, *p* < 0.01).	Regression analyses: UK: mistrustful children significantly more likely to have lower SE (OR = 1.28, *p* < 0.01, CI [1.11, 1.48]), after controlling SES. Not significant after controlling verbal ability (OR = 1.00, *p* = 0.92, CI [0.94, 1.07]). Home, school and general mistrust predicted low SE

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses
			Medium negative associations between RSES and home mistrust (r = -0.47, p < 0.01), school mistrust (r = -0.43, p < 0.01) and general mistrust (r = -0.45, p < 0.01)	(OR = 2.16, p < 0.05, OR = 2.86, p < 0.001, OR = 2.47, p < 0.01). HK: mistrustful children significantly more likely to have lower SE. Not significant after controlling SES (OR = 1.03, p = 0.58) or verbal ability (OR 1.02, p = 0.48). Only school and general mistrust significantly predicted low SE (OR = 2.49, p < 0.001, OR = 3.76, p < 0.001).
Wu et al. (2021)	MMHI-60 – Paranoia subscale	Anxiety (MMHI-60 – Anxiety subscale)	Medium positive association (ρ = 0.59, p < 0.001)	Within-subjects analysis: Significant differences in changes of anxiety across T1 and T2 in 4 PLEs subgroups: no PLEs, remitted PLEs, new PLEs and persistent PLEs (Kruskal-Wallis h = 211, p < 0.001).

Note. r = 0.10 = small effect size, r = 0.30 medium effect size, r = 0.50 large effect size

First author (Year)	Paranoia Measure	Associated Variable(s) and Measure(s)	Correlational Findings (Pearson's *r*/Spearman's ρ, significance)	Additional analyses

Key. A-DES = Adolescent version of the Dissociative Experiences Scale; APIM = Actor-Partner-Interdependence Model; ASWS = Adolescent Sleep Wake Scale–Short; BADE = Bias Against Disconfirmatory Evidence; B-CAP = Bird Checklist of Adolescent Paranoia; BCSS = Brief Core Schema Scale; BL = Baseline assessment; BSMAS = Bergen Social Media Addiction Scale; CAPE = Community Assessment of Psychic Experiences; CI = Confidence Interval; DAG = Directed Acyclic Graph; DASS = Depression Anxiety Stress Scales; DE = Direct Effect; DES = Dissociative Experiences Scale; DZ = Dizygotic twin pairs; FU = Follow-up assessment; GPTS = Green et al. Paranoid Thoughts Scale; IE = Indirect Effect; ISI = Insomnia Severity Index; JTC = Jumping to Conclusions; LSHS-R = Revised Launay–Slade Hallucination Scale; MMHI-60 = Mental Health Inventory of Middle school students; MSB = Measure of Safety Behaviours; MZ = Monozygotic twin pairs; N/A = Not Applicable; NR = Not Reported; PLEs = Psychotic Like Experiences; PS = Paranoia Scale; PSQI = Pittsburgh Sleep Quality Index; PSWQ-C = Penn State Worry Questionnaire for Children; PTCI = Posttraumatic Cognitions Inventory; PTT = Perspective Taking Task; RCADS = Revised Children's Anxiety and Depression Scale; R-GPTS = Revised Green et al. Paranoid Thoughts Scale; rph = phenotypic correlations; RSES = Rosenberg Self-Esteem Scale; SEM = Structural Equation Modelling; SMS = Social Mistrust Scale; SPEQ = Specific Psychotic Experiences Questionnaire; SPP = Self-Perception Profile; T1 = Baseline assessment; T2 = first follow-up; T3 = second follow-up; ToM = Theory of Mind; TST = Total Sleep Time; UEQ = Unusual Experiences Questionnaire

Table 13

Quality Assessment

First author (Year)	Cross-sectional				
	Selection (Maximum 5 points)	Comparability (Maximum 2 points)	Outcome (Maximum 3 points)	Overall Score (Maximum 10 points)	Overall rating
Gin et al. (2021)	3	2	2	7	Good
Bird et al. (2019)	3	1	2	6	Fair
Campbell et al. (2007)	3	1	2	6	Fair
Catone et al. (2017)	4	2	2	8	Good
Galbraith et al. (2014a)	4	2	2	8	Good
Hollowell et al. (2020)	3	2	2	7	Good
Korver-Nieberg et al. (2013)	2	2	2	6	Fair
Schonig et al. (2024)	4	1	2	7	Good
Taylor et al. (2015)	4	2	2	8	Good
Wong et al. (2014)	2	2	2	6	Fair
	Longitudinal				
	Selection (Maximum 5 points)	Comparability (Maximum 2 points)	Outcome (Maximum 3 points)	Overall Score (Maximum 11 points)	Overall rating
Bird et al. (2017)	3	1	3	7	Fair
Hennig et al. (2018)	1	1	2	4	Poor[a]
Kingston et al. (2022)	5	1	1	7	Fair
Wu et al. (2021)	4	0	3	7	Fair

Note. [a]interpret rating with caution due to low applicability of quality assessment tool to the study methodology.

4. Discussion

The aim of the current review was to examine the extent to which the cognitive model of PD (Freeman et al., 2002; Freeman, 2016) can be applied to understanding paranoia in children and adolescents. It examined this by providing a narrative review of quantitative studies investigating the relationships between paranoia and 1) worry/anxiety, 2) negative self-beliefs, 3) anomalous experiences, 4) sleep dysfunction, 5) reasoning bias, and 6) safety behaviours in young people up to the age of 18 years old. The review identified 14 eligible studies.

4.1. Main findings

The results demonstrated that there was a medium to large relationship between paranoia and worry or anxiety in general population and clinical adolescents. Whilst not directly comparable as the studies included were cross-sectional or longitudinal, this supports experimental findings in adults (Ellett et al., 2023). In support of the cognitive model, there was evidence from the present SR that anxiety increases with paranoia (Wu et al., 2021). From reviewing the literature, only one longitudinal study provided insights into directionality for adolescents. A bi-directional relationship was indicated whereby higher levels of paranoia predicted future levels of worry and worry predicted future levels of paranoia (Kingston et al., 2022). Although associations between paranoia and worry/anxiety were studied longitudinally in 3 studies, the studies were limited by small sample sizes (Bird et al., 2017), not controlling for baseline measurements (Wu et al., 2021) and short follow-up periods (Kingston et al., 2022). Despite this, the results provided preliminary support that this process is applicable to adolescent paranoia; that is, worry and anxiety are associated with paranoia in young people across the paranoia spectrum. It is thought that anxiety and worry may both contribute to and be a consequence of paranoia. As has been done in the adult literature (Sun et al., 2019), to elucidate this relationship further and establish any unique effects, research could longitudinally investigate the influence of both worry and anxiety in a mediation model of paranoia. This would extend previous mediation models in adolescents (Galbraith et al., 2014a; Kingston et al., 2022), may allow for greater

understanding about their specific roles in paranoia development, and clarify whether general anxiety or specific worry contributes more to paranoia in young people.

Negative self-beliefs were most researched in adolescents, but they were measured in various ways which limited comparison. When negative self-beliefs were investigated, large effects were found with paranoia across the continuum (Bird et al., 2017; Galbraith et al., 2014a), which parallels findings in adults (Humphrey et al., 2021). For self-esteem, findings showed slightly lower but still moderate associations with paranoia in clinical (Bird et al., 2017) and non-clinical samples in both the UK and Hong Kong (Wong et al., 2014). The literature was limited by cross-sectional evidence and only one study provided some temporal understanding of this association with general population adolescents. Contrary to adult findings (Atherton et al., 2016; Fowler et al. 2012; Kesting et al., 2013; Sood et al., 2021; Udachina et al., 2009), in a mediation model whereby paranoia impacted on future levels of well-being through self-esteem, stronger evidence was found for paranoia impacting on low self-esteem, rather than low self-esteem impacting on future paranoia (Kingston et al., 2022). Interestingly, three studies investigated associations between paranoia and specific types of negative self-beliefs related to social relationships or contexts (Bird et al., 2017; Bird et al., 2019; Campbell & Morrison, 2007). Findings showed that bullying and negatively comparing oneself to others may be relevant to the association between negative self-beliefs and paranoia in young people. This offered insight into more specific factors that may be developmentally relevant to adolescent experiences. In sum, the findings from the present review supported the cognitive model. The findings showed that negative self-beliefs are important to understanding adolescent paranoia, but more longitudinal evidence is needed to establish temporal pathways over a longer period. In addition, findings indicated that negative beliefs about other people may also be important to adolescent paranoia (Galbraith et al. 2014a; Gin et al., 2021). As depression has been consistently found to confound or explain associations between negative self-beliefs and paranoia in adults (Fowler et al. 2012; Galbraith et al., 2014b; Vorontsova et al., 2013), the adolescent literature should consider controlling for depression or negative affect, or indeed investigate their mediating or moderating effects.

This review identified six studies assessing the relationship between anomalous experiences and paranoia in young people, which focussed on hallucinations and dissociation only. Aligning with the adult literature (Freeman & Loe, 2023), cross-sectional evidence in the present review mostly found moderate to large associations across clinical (Catone et al., 2017) and non-clinical adolescent populations (Bird et al., 2017; Campbell & Morrison, 2007; Galbraith et al., 2014a). However, often the relationships did not remain significant once other factors were controlled for or entered as mediators. For example, there were findings that suggested the relationship between hallucinations and paranoia was entirely explained by schemas, anxiety and social functioning (Galbraith et al., 2014a). The only longitudinal investigation into the association between hallucinations and paranoia found no significant association after controlling for initial paranoia severity (Bird et al., 2017). However, the correlational design precluded conclusions about directionality and the findings were limited by small sample size, thus the study was likely underpowered to detect significant effects. With regards to dissociation, no effect of dissociation on paranoia was found over time in the daily life of adolescents, but this may have been impacted by the low rates of dissociation reported by the non-clinical sample (Hennig & Lincoln, 2018). However, a high-quality cross-sectional study with clinical participants, wherein dissociation was reported, also did not find a predictive effect of hallucinations on paranoia (Gin et al., 2021). The cognitive model indicates that anomalous experiences may directly lead to PD development, or instead anomalous experiences can be triggered by negative affect or cognitive biases, which then leads to PDs (Freeman, 2016; Freeman et al., 2002). In relation to this, the findings from the study's included in the SR showed that while anomalous experiences and paranoia may be related in adolescence, anomalous experiences may not have a direct effect on adolescent paranoia development. Instead, the findings suggested that other factors, such as anxiety and negative beliefs about other people, may be responsible for the associations. These assertions are however limited because only one cross-sectional study (Galbraith et al., 2014a) has, to some extent, attempted to explore these relationships, thus precluding temporal conclusions. Therefore, instead of focussing on examining direct associations between anomalous experiences and adolescent paranoia, further

research may benefit from examining the complex associations between anomalous experiences, negative affect, cognitive biases and paranoia, longitudinally.

In-line with adult findings, associations were consistently found between paranoia and sleep difficulties, both cross-sectionally and longitudinally, and in both clinical and non-clinical adolescents (Bird et al., 2017; Bird et al., 2019; Hennig & Lincoln, 2018; Taylor et al., 2015). Only one study allowed for inferences to be made about the temporal associations, however. Using robust objective and subjective ESM measures with general population adolescents, Hennig and Lincoln (2018) found stronger evidence to suggest that sleep impacted on paranoia, rather than paranoia preceding sleep difficulties. Furthermore, in support of the cognitive model and adult literature (Freeman & Garety, 2014; Freeman et al., 2009; Lüdtke et al., 2023; Reeve et al. 2018), negative affect played a significant role in this association, suggesting that sleep difficulties impact on paranoia through the impact on affect (Bird et al., 2019; Hennig & Lincoln, 2018; Taylor et al., 2015). Although only four studies were identified that examined the association between sleep and paranoia, one was a high-quality, large-scale twin study (Taylor et al., 2015), which enhances the robustness of the findings.

With regards to reasoning biases, JTC, ToM and BADE have been studied with adolescents. The association between JTC and paranoia was most studied, but only three studies were identified. In two studies with adolescents with emergent psychosis or other mental health presentations (Bird et al., 2017; Gin et al., 2021), there was limited evidence of a JTC bias being present in the samples, and no cross-sectional evidence for an association was found (Gin et al., 2021). Additionally, the tendency to make hasty decisions did not impact on associations between high levels of anxiety and paranoia in non-clinical young people (Galbraith et al., 2014a). A case-control study indicated that ToM may not be impaired in adolescents experiencing early psychosis (Korver-Nieberg et al., 2013) and in general population adolescents, no association was found between paranoia and BADE (Hollowell & Ronald, 2020). Of note, most of the studies assessing reasoning biases had relatively small sample sizes, which could have impacted on the ability to finds effects. Nevertheless, the lack of associations found

between paranoia and a range of reasoning biases are surprising given that higher order cognitive processes, such as social cognition and cognitive control are still under development in young people (Uhlhaas et al., 2023). One might expect to find the presence of reasoning biases in this developmental phase. However, research suggests that cognitive biases may be more likely in individuals with more severe persecutory ideation or psychosis (Freeman & Garety, 2014; Dudley et al., 2016; Reininghaus et al., 2019). Therefore, the occurrence of reasoning biases may be associated with a later stage of illness and greater impairment rather than in the early development of paranoia. Given the association with age, a strength of three of the studies were that they controlled for age in the analyses (Galbraith et al., 2014a; Hollowell & Ronald, 2020; Korver-Nieberg et al. 2013). In sum, the effect of reasoning biases may be more relevant to adults or individuals with more persistent paranoia. This is not to say that reasoning biases are not at all important in youth, as early intervention aimed at enhancing young people's awareness of reasoning biases, for instance through metacognitive training (Parker et al., 2020), may reduce risk of developing psychosis or experiencing a worse course of illness.

Only two cross-sectional studies were identified that investigated the association between paranoia and safety behaviours, therefore limiting any conclusions. In-line with adult findings (Freeman & Loe, 2023), both the papers identified in the SR found strong associations, suggesting that higher levels of paranoia were associated with increased use of safety behaviours (Bird et al., 2019; Schönig et al., 2024). The methodology used by Bird et al. (2019) allowed for some understanding into the temporal nature of the association. It was suggested that feelings of paranoia were more likely to lead to increased use of safety behaviours when using social media, than the reverse. This supports the cognitive model, which suggests that safety behaviour use occurs as a reaction to paranoid thinking (Freeman et al., 2002). Although these findings provide preliminary evidence for an association in young people, because safety behaviour use is thought to maintain paranoia, longitudinal evidence is needed to understand how safety behaviours impact on paranoia over time. Both studies were conducted with non-clinical populations, hence findings cannot be generalised to clinical adolescents. Given safety behaviours are also a key part of social anxiety, and social anxiety and paranoia are

associated and often co-occur (Aunjitsakul et al., 2022; Freeman & Loe, 2023; Schutters et al., 2012), future research could control for social anxiety when examining this association.

4.2. Evaluation of the Literature

Several strengths and weaknesses of the evidence base were identified in addition to those already discussed. Studies were highly heterogeneous in terms of design, sample size, methodology and quality. The samples lacked diversity in terms of ethnicity, were majority female, and were in most part recruited from white, Western populations. Only two studies were conducted in non-Western countries, including China and Hong Kong. This limits the generalisability of the findings and hinders the theoretical understanding of paranoia in non-Western populations. As cultural and contextual differences are known to influence paranoid thinking (Freeman & Garety, 2014; Freeman & Loe, 2023; Ghanem et al., 2023), it is likely that the literature is influenced by cultural biases. Western conceptualisations of paranoia may not reflect how paranoia is experienced and expressed in non-Western cultures, and culturally specific factors influencing its development and maintenance may therefore be overlooked. Given Western definitions of paranoia involve "unfounded" attributions of harmful intent to others (Freeman, 2016), it is important not to pathologise or misattribute 'problematic' beliefs to minoritised groups, whose "paranoia" may be an understandable and adaptive response to discrimination and may indeed have a protective effect (Kingston et al., 2023; Raihani & Bell, 2018). It is important that studies seek to increase cultural representation, report on ethnicity and understand expressions of paranoia across different cultures and contexts. Specifically, comparative studies are required to better understand the manifestation of adolescent mistrust across different cultures and contexts.

Measurements used to assess paranoia varied substantially making comparison across studies challenging. This may be because most studies focussed on measuring a range of PLEs, rather than the focus of the study being on paranoia. Other reviews have recommended using the R-GPTS for assessing paranoia due to its superior psychometric properties (Statham et al., 2019), particularly for child and

adolescent populations (Schlier et al., 2024). There is a need for future research in adolescents to use more consistent measures.

The quality of most of the studies was impacted by lack of reporting about sample size calculations. Therefore, it is recommended that future research describes the a priori calculation and justifies the sample size used. A strength of the literature was that all bar one study controlled for at least one confounding factor.

Only four longitudinal studies were identified. Therefore, the evidence base is limited by cross-sectional research which does not allow for more nuanced understanding about the temporal relationships between the processes examined. Many of the findings discussed only allow for inferences regarding the strength of associations and hypotheses about temporal associations based on theoretical knowledge and adult evidence. To advance the literature and enhance the reliability and validity of the findings, more large-scale, cross-cultural, longitudinal studies are needed to assess how paranoia develops over time in children and adolescents.

4.3. Evaluation of the Review

This review should be considered in light of several limitations. Researchers may interpret the cognitive model of PD differently, thereby influencing decisions regarding the inclusion and exclusion of studies. For example, anomalous internal experiences may be considered an ambiguous concept with many different experiences falling under this category. In this review, heightened arousal was not included in the search strategy due to difficulties defining it. A review on the adult literature included negative affect under this category (Lüdtke et al., 2023). However, although negative affect is a key underlying component of the model, it is argued that it is not an anomalous experience per se. It could be argued that negative affect falls alongside worry and anxiety, and its inclusion in this category may have led to more studies being identified. However, the narrow focus on anxiety and worry is line with descriptions of the model (Freeman et al., 2002; Freeman, 2016; Freeman & Garety, 2014) and the key findings regarding the influence of negative affect from the studies identified in the SR have been

discussed. It should be noted that dissociation was not included in the search strategy as this experience is not mentioned in earlier papers (Freeman et al., 2002). It was later deemed relevant due to more recent literature (Freeman & Loe, 2023). This may have impacted on the systematic rigour of the SR, however, during the screening process, papers examining its association with paranoia were included due to their relevance for understanding adolescent paranoia. Nevertheless, some papers examining its association with paranoia may have been missed.

While the present SR focussed on assessing self-report paranoia to capture adolescent experiences, self-report measures may be impacted by recall and reporting bias. This meant that findings using parent- or clinician-ratings were omitted. Including these may have added to the interpretability of findings and furthered the understanding of adolescent paranoia.

A strength of the review is its comprehensive search strategy and definition of paranoia which allowed for better understanding of the paranoia spectrum in young people. It is however possible that despite this some papers examining paranoia were missed. Although the search strategy was developed in-line with other reviews in the area (Humphrey et al., 2021; Statham et al., 2019), including “schizotypy” may have led to the identification of more papers (Bennetts et al., 2021), since paranoia is a subcomponent of schizotypy (Wong & Raine, 2018).

4.4. Implications

Despite its limitations, the review offers new insights into the development and maintenance of childhood paranoia. Understanding more about the cognitive underpinnings of paranoia in children and adolescents has important implications for theory, research and clinical practice.

Theoretically, the results suggest that most processes implicated in the cognitive model of PD are associated with paranoia in adolescents, but whether they cause and maintain it is unclear. Worry and anxiety, or negative affect more generally, as well as negative self-beliefs appear to be most significant to paranoia at this stage of development. There is evidence that sleep difficulties may affect paranoia through the impact on negative affect, and young people experiencing paranoia may seek to protect

themselves through safety behaviours. There is less evidence for a direct pathway from anomalous experiences to paranoia in this developmental stage, but the association may occur indirectly through other factors, such as negative affect. Reasoning biases seem to be unrelated to adolescent paranoia. In support of the cognitive model, negative affect appeared to play a crucial role in paranoia development and maintenance in children and adolescents.

Several future directions have already been discussed, but overall, there is a clear need for research to examine more about the adolescent experience of paranoia. Rather than applying adult models to children and adolescents, research should seek to adapt what is already known and extend this by addressing the unique developmental differences associated with young people. In particular, the dynamic and context-dependent nature of this developmental stage. This approach may aid the discovery of risk and resilience factors for emerging mental health issues (Uhlhaas et al., 2023). This understanding could be enhanced through qualitative exploration with young people lower down the paranoia spectrum, or indeed youth involvement in research.

The knowledge from this review can be translated into clinical practice to better serve young people. The cognitive model suggests that to support individuals struggling with paranoia, they must re-learn safety through a reduction in the six processes. By doing so, they learn that threat will not occur (Freeman, 2016). This review highlights that intervention aimed at reducing negative self-beliefs and negative affect, including worry and anxiety, helping young people to tolerate distress and supporting sleep may all be helpful. In adults, there have been several trials that have evaluated targeted interventions to support PDs which provide promising results. For example, the Worry Intervention Trial (Freeman et al., 2015a), the self-confidence trial (Freeman et al., 2014) and the Feeling Safe Programme (Freeman et al., 2021). Recently, in young people at UHR of psychosis, the SleepWell intervention has demonstrated feasibility and positive long-term effects on sleep problems (Waite et al., 2023). While taking this individualised, transdiagnostic approach may be helpful for supporting young people experiencing paranoia, this review highlighted that we should not assume

that models and interventions developed for adults also apply to young people. Greater focus should be spent on developing developmentally sensitive, novel interventions, co-produced between researchers, clinicians and young people.

4.5. Summary and Conclusion

This is the first SR of the child and adolescent literature designed to examine whether the six core processes implicated in the cognitive model of PD are applicable to paranoia experiences in young people. Although the evidence base on childhood paranoia is limited and mostly cross-sectional, the review provides evidence that most processes are associated with paranoia in adolescents, but whether they cause and maintain it is unclear. Anxiety, worry and negative self-beliefs appear to be important across the paranoia spectrum. Additionally, sleep difficulties may impact on paranoia through negative affect. Although the findings were limited by high heterogeneity, anomalous experiences and reasoning biases do not appear to be associated with childhood paranoia in the same way as in adults. More research is needed to examine the role of safety behaviours, but preliminary evidence suggests that this process may be relevant to young people. More large-scale longitudinal evidence is needed to examine how adolescent paranoia evolves over time. There is an imperative need to develop child- and adolescent-specific models that test other factors known to be relevant to this dynamic developmental stage, rather than assuming adult models apply. Once our theoretical understanding has advanced, this knowledge can be used to develop and trial novel, targeted interventions that may be effective for reducing paranoia in young people.

Chapter 3: Integration, Impact and Dissemination

Integration

Adolescent mental health is a major public health concern. The worldwide prevalence of mental health disorders in children and adolescents is around 13.4% (Polanczyk et al., 2015) and young people are disproportionately affected by worsening mental health (Ward et al., 2019). Further, around 48.4% of mental health conditions occur before the age of 18 (Solmi et al., 2021). Adolescence offers a window of opportunity for early identification and intervention to prevent poor outcomes for young people themselves, their families, the community, and the economy (McGorry et al., 2022). Therefore, understanding the factors that increase vulnerability to poor mental health in this sensitive developmental period should be a priority.

Experiences of paranoia are highly prevalent in adolescence. Paranoia can impact negatively on the lives of young people and confer risk for enduring mental health difficulties (Bird et al., 2019; Bird et al., 2021; Bird et al., 2022). Therefore, the overarching aim of this thesis was to advance the understanding of adolescent paranoia and to identify potential risk factors. The SR sought to examine whether the cognitive model of persecutory delusions (PD), developed primarily for adults, could be applied to young people. The SR focussed on this model as it is the main theoretical model of paranoia. However, no theoretical models have been developed specifically for young people. While conducting the SR helped me gain a better understanding of the literature, it identified that our understanding of adolescent paranoia is still in its infancy and models that account for this unique stage of development are needed to help explain the high prevalence. Therefore, the research question for the empirical study was to examine the relationship between paranoia, sense of belonging, self-esteem and self-concept clarity in adolescents. The empirical study focussed on investigating the role of these factors on adolescent paranoia based on findings in the adult literature and because they are all highly relevant to the adolescent developmental stage. Further, it was hoped that it may enhance our theoretical understanding of paranoia development and maintenance in adolescence.

The SR helped me to gain a better understanding of the interplay between theory, research and clinical practice. I could see how the cognitive model was used to guide research on adult paranoia, and from this understanding, targeted interventions could be developed and tested. Because there are no child or adolescent-specific models, this may have limited research endeavours in young people and hence affected our ability as professionals to identify paranoia and support young people struggling with these experiences, as demonstrated in a qualitative study by Bird et al. (2022). This is of course further limited by the setup of services which are high threshold and often require a diagnosis to access support (McGorry et al., 2022). This has made me reflect on my own research interests and clinical practice. In particular, I valued the experience-led focus of this thesis. I can see how recognising individual experiences across the continuum of severity can advance the understanding of how and why psychological phenomena progress and the mechanisms that underlie them and cause distress, thereby allowing for advancements in individualised, needs-led treatments.

The findings from the SR and empirical study highlight the need for more large-scale longitudinal designs to examine how paranoia develops over time. Although initially the primary aim for the empirical study was for it to be longitudinal, it was not feasible due low sample size. I was not able to begin data collection when expected as the focus of the project unexpectedly changed in September 2023 and recruitment of schools came to a standstill over the summer holidays. Although many more schools expressed interest in participating, often they were unable to make it possible due to the pressures already placed on them. Furthermore, scope to recruit a large pool of participants was impacted by consent procedures as opt-in consent was required. Difficulties with recruitment and having to fit data collection around school timetables and holidays meant that time frames needed to be adjusted and recruitment took much longer than anticipated. Schools were chosen to recruit adolescents from as it was thought that it would allow for greater accessibility to young people and efficiency of data collection. However, this project highlighted the challenges researchers face when trying to study young people in an ethical manner. Thus, limiting researcher's ability to obtain a large sample size. Conducting this research highlighted to me the substantial amount of time and resources

that go into conducting ethical research of a high quality, and that often studies require adaption based on what is feasible.

Consulting with young people during the study design stage was invaluable. This allowed me to make changes to the study materials, which increased accessibility and made them more engaging to young people. Moreover, it confirmed that the focus of my study was important to young people themselves. In addition to this, it would have been important to involve teachers as they have firsthand knowledge of the school environment and the potential barriers and challenges that might arise. This could have enhanced my study's design and increased participation from schools. This highlights the importance of involving a range of relevant stakeholders in research (NIHR, 2010).

I attempted to enhance participant retention by being flexible, establishing strong relationships with the schools, providing incentives, and sending reminders. However, on reflection, there were approaches I could have taken to increase the likelihood of obtaining more complete data across the three time-points, which may have increased statistical power in my longitudinal dataset. For example, I could have left questionnaire packs for participants to complete in my absence if they were missing at data collection. Additionally, to minimise questionnaire fatigue I could have condensed my measures by using the 5-item RSES (Monteiro et al., 2021) and assessed fewer social identity groups in the sense of belonging measure. This is relevant as this measure assessed school belonging, but school belonging was also assessed separately using the PSSM. Additionally, future research could opt for online survey platforms for data collection to enhance reachability. Another benefit of online platforms is that they allow for restrictions to be placed so respondents are required to answer every question, which may limit missing data.

An important limitation of the empirical study was the use of mediation with cross-sectional data. This is because statistical mediation allows for greater understanding about how and why psychological processes occur and are therefore an inherently a longitudinal process (Montoya, 2022). This limited information about the temporal order of my associations, which indeed were not

replicated longitudinally. To strengthen the statistical methods, I could have used cross-lagged panel models. I have discussed this limitation in Chapter 1, and I have tried not to make claims beyond the scope of the analysis used.

Overall, these studies have furthered my theoretical knowledge, informed my research interests, enhanced my statistical knowledge, and guided my clinical practice when working with young people.

Impact

The main impact of the SR and empirical study is that they have advanced the theoretical understanding of paranoia in children and adolescents. Both studies fill a gap in the literature by extending what is known about paranoia in adults to young people. Though the cognitive model of PD had been tested cross-sectionally (Gin et al., 2021) and longitudinally (Bird et al., 2017) in clinical samples of adolescents, the SR brought the existing, albeit limited, evidence base on paranoia in young people together to provide a thorough and critical synthesis across the paranoia spectrum. This allowed for the identification of gaps, inconsistencies and a comprehensive comparison with the adult literature. The findings showed that we cannot assume that theoretical models apply across the life span. Researchers must consider the biological, cognitive, social and cultural changes that occur through development, and adapt and develop new models according to life stage. This may allow for greater specificity when understanding psychological experiences, which can help guide theory development for young people and inform future research and clinical practice.

Recent developments in theory have highlighted the importance of social processes when understanding paranoia in adults (Freeman & Loe, 2023; Greenaway et al., 2018). Given the importance of social factors to the adolescent development stage, the empirical study extended the adult literature by investigating whether the social identity model was applicable to adolescents. While the effects of belonging, self-esteem and self-concept clarity on paranoia were only found cross-sectionally and causality cannot be inferred, the findings provide preliminary evidence that these

factors may be important to our theoretical understanding in adolescence. Additionally, the findings support the view that persecutory ideation does not only occur in clinical populations, and rather it reflects a continuum of severity. This was evidenced by the wide range of paranoia scores and high levels of paranoia severity reported in this non-clinical sample. Investigating paranoia in non-clinical groups of young people is therefore important, particularly given the increasing rates of mental health difficulties in young people. Understanding non-clinical paranoia has important implications for theoretical developments. For example, including the full spectrum of experience enhances the generalisability of theories and may allow for early identification of mechanisms that both contribute to and protect against its development.

Despite the phenomenological similarities between adult and adolescent paranoia, the study's findings have indicated that there is a lot we do not know about the underpinnings of paranoia in adolescents. The findings and discussion points from Chapter 1 and 2 can be used to inspire and shape future research seeking to understand paranoia in young people. Although many of the processes implicated in the cognitive model of PD do appear to be associated with paranoia in adolescents, it is unclear whether they cause and maintain it. Therefore, further longitudinal and experimental evidence is needed to ascertain temporal and causal factors. An interesting avenue for future experimental research would be use of VR to test the effects of social exclusion on paranoia.

Furthermore, there is a need for research in young people to adopt a developmentally sensitive approach by investigating the impact of relevant social and contextual factors on adolescent paranoia. The empirical study requires longitudinal replication with a larger sample size and over a longer time period to confirm directionality. From a theoretical perspective (Freeman et al., 2002), it could be hypothesised that young people with low self-esteem and self-concept clarity are more likely to experience feeling of difference and a lack of belonging, and the social exclusion that results from the lack of belonging leads to paranoid thinking. Examining whether low self-esteem and self-concept clarity may lead to paranoia through the mediating role of a lack of belonging could be an interesting

direction for future research. McIntyre et al. (2018a) and Monsonet et al. (2023) investigated the effects of different types of social identity groups on adult paranoia. Therefore, replicating this with young people would be helpful to identify what social groups impact on paranoia development the most, which could allow for targeted interventions in those contexts. Additionally, given the findings on school belonging, a future direction for research could be to develop a school-based intervention aimed at enhancing school belonging based off previous research (Allen et al., 2022), but extending this by looking at whether it reduces paranoia.

The wide heterogeneity of symptoms found across and within discrete diagnostic categories can be problematic for both research and clinical practice (Allsopp et al., 2019). Instead, there is support for understanding shared symptoms, or experiences, of overlapping mental health disorders (Dalgleish et al., 2020; Freeman, 2016). Taking an experience approach allows research to examine young people across the continuum of human experiences. Overall, this research shows that the experience of paranoia in young people is worthy of individual study.

Although preliminary, the results of the SR and empirical study could be used to inform mental health care. Shifting the focussing to understanding common experiences, rather than diagnoses, offers a de-stigmatising and normalising approach. This may encourage help-seeking for subclinical and potentially transient problems, allowing for proactive and potentially preventative support. However, translating this transdiagnostic, clinical staging and needs-led approach from research to clinical practice may require changes to current mental health infrastructure given that access to support is often contingent on diagnosis or high levels of distress (McGorry et al., 2022). Researchers have argued for removal of these barriers through community-based prevention and early intervention, lowering the threshold for service access, school-based programmes, digital mental health platforms, and youth participation and co-design (McGorry et al., 2022; Uhlhaas et al., 2023). The findings from the empirical study could be used to support community psychology approaches

and psychological approaches such as narrative therapy, which encourage connectedness, stronger identity formation and sense making.

To create the most change, the aim of interventions for young people struggling with paranoia should be to target the key mechanisms underlying their individual experience (Freeman, 2024). This requires CAMHS clinicians to assess for paranoia and, if identified as a presenting problem, to co-develop an individualised psychological formulation which explains the factors that may be contributing to its occurrence. This may allow for individualised treatment approaches to be identified alongside the young person, such as sleep hygiene, CBT for anxiety, behavioural experiments that challenge anxiety-related cognitive processes, or culturally sensitive social inclusion approaches. Several intervention trials aimed at targeting the six core processes of PDs have been conducted or are currently under investigation for adults and young people with psychosis-spectrum disorders (Bond et al., 2023; Freeman et al., 2024; Freeman et al., 2023; Tolmeijer et al., 2023; Waite et al., 2023). Further investigations are needed to examine whether these can be applied and adapted to suit the needs of young people lower down the spectrum of severity.

This research has suggested that school belonging is associated with paranoia. Although, this requires further longitudinal investigation, there are several important insights that schools may take away. Firstly, this research may increase teachers' awareness of paranoia and how it affects young people. Given young people spend most of their time at school, this knowledge may help teachers to identify paranoia or students who may be experiencing early signs of mental health issues, and this may in turn allow for timely access to support. Additionally, through writing this thesis, I have wondered whether paranoia may play a role the increasing rates of school absences, particularly following the pandemic (Long & Roberts, 2024). Whilst this requires further study, it may be important for professionals to assess and hold this in mind when young people are experiencing social withdrawal and school refusal. Furthermore, while schools do their upmost not to exclude young people, this research has highlighted the negative effects that exclusion can have on young people's well-being. As

discussed in Chapter 1, this research may encourage schools to consider how they can create a more inclusive atmosphere that fosters greater sense of belonging. It also supports the need for school-based initiatives, which are reflected in the NHS Long Term Plan.

The findings from the empirical study and SR highlight important social and cultural issues. Cultural norms can impact differently on children's development, including how their personal and social identity is formed. More rural collectivist cultures lend themselves to relatedness through emphasis on community bonds, cooperation and shared goals, whereas Western societies place greater emphasis on formal education, psychological autonomy, individuality and separateness (Keller, 2017). Given that trust is an inherently relational experience, there are aspects of Western society that encourage disconnection from others which may foster more paranoid thinking. This is particularly relevant for adolescents whose lives and mental health have been greatly affected by the COVID-19 pandemic, which also exacerbated isolation and fears about threat (Shah et al., 2020; Wu et al., 2021). This thesis highlights the impact of social issues, such as a lack of social ties, on young people's mental health. There are things we can learn from other cultures that may help to shape a more connected society and improve well-being. For example, encouraging the development of community groups, promoting policies that support connectedness, and focussing on strengthening family and community bonds.

While it is acknowledged that the findings of the empirical study are preliminary and require further research to inform public policy and guidelines, they offer some support for the need for pay greater attention to the social determinants of health (World Health Organisation, 2021). As discussed in Chapter 1, the development of policies that increase social connectedness and that create social conditions that foster well-being are needed. Indeed, childhood poverty and social disadvantage confer greater risk for mental ill-health (Evans & Cassells, 2014; Morrison-Gutman et al., 2015), which is associated with educational underachievement, loss of employment and higher healthcare costs (Patel et al., 2007). Therefore, focussing on enhancing young people's emotional well-being through

reducing social determinants of health has the potential to affect individuals across the life span (Kieling et al., 2011), which has obvious public-health significance.

Dissemination

The study findings were presented in-person to one of the schools who took part. An accessible summary has been sent to the schools who participated so it can be shared with students and their parents/caregivers. It was initially hoped that the summary would be co-produced with a group of young people from one of the schools. However, data collection took longer than anticipated and due to students' study leave and time restrictions before the end of the term, this was not possible.

The findings will also be presented to a range of groups. I have presented the findings of my empirical study to other Trainee Clinical Psychologists at Royal Holloway, University of London. I hope that this increased understanding of adolescent paranoia, and the factors which influence it. This awareness may influence their own clinical practice when working with individuals experiencing paranoia. The presentation may have also informed them about the challenges of conducting research in child and adolescent groups, and this knowledge may better equip them for their own research. The findings have also been presented to the CAMHS service I am currently working in. The findings are highly relevant to the young people we support, such as those looked after in care and who have sought asylum in the UK. These are particularly underserved groups, who have often experienced multiple levels of social exclusion, lack a sense of belonging, find it more challenging to establish a sense of personal identity, and understandably feel extremely mistrustful of others due to their adverse experiences. It is also very difficult for these young people to feel a sense of belonging when they experience on-going instability and uncertainty (Sinclair et al., 2020). Furthermore, rates of school absences and exclusions are extremely high for care experienced young people (Department of Education, 2024). It is therefore imperative that we as a team find ways to enhance these young people's connectedness, protect them from further exclusion, and consider ways in which we can

support them to develop trusting relationships. Furthermore, writing this thesis has also allowed me to identify relevant literature to share with the multidisciplinary team to inform their clinical practice.

Finally, I plan to publish my study in a peer-reviewed journal. Journals that align with the research area and methodology include, 'Research on Child and Adolescent Psychopathology', 'Schizophrenia Research' and 'Psychology and Psychotherapy: Theory, Research and Practice', all of which have published studies in the same area (Bird et al., 2022; Gin et al., 2021; Hollowell & Ronald, 2020; Kingston et al., 2022; Schönig et al., 2024; Wu et al., 2021). Publication will allow my findings to be disseminated to a wider audience, which may inform future research directions and clinical practice.

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Appendices

Appendix A

Sense of Belonging

Please read each of the statements carefully. They refer how connected you feel to certain groups. Think about each group and indicate the extent of these feelings from **1 (Not at all) to 7 (Very much)**.

STATEMENTS	**Not at all**						**Very much**
1. I feel a sense of belonging to my **school**	1	2	3	4	5	6	7
2. I identify with my **school**	1	2	3	4	5	6	7
3. I feel strong ties with my **school**	1	2	3	4	5	6	7

STATEMENTS	**Not at all**						**Very much**
4. I feel a sense of belonging to my **friends**	1	2	3	4	5	6	7
5. I identify with my **friends**	1	2	3	4	5	6	7
6. I feel strong ties with my **friends**	1	2	3	4	5	6	7

STATEMENTS	**Not at all**						**Very much**
7. I feel a sense of belonging to my **peers at school**	1	2	3	4	5	6	7
8. I identify with my **peers at school**	1	2	3	4	5	6	7
9. I feel strong ties with my **peers at school**	1	2	3	4	5	6	7

STATEMENTS	**Not at all**						**Very much**
10. I feel a sense of belonging to the **village/town/city I live in**	1	2	3	4	5	6	7
11. I identify with the **village/town/city I live in**	1	2	3	4	5	6	7
12. I feel strong ties with the **village/town/city I live in**	1	2	3	4	5	6	7

STATEMENTS	Not at all						Very much
13. I feel a sense of belonging to my **online communities**	1	2	3	4	5	6	7
14. I identify with my **online communities**	1	2	3	4	5	6	7
15. I feel strong ties with my **online communities**	1	2	3	4	5	6	7

STATEMENTS	Not at all						Very much
16. I feel a sense of belonging to my **family**	1	2	3	4	5	6	7
17. I identify with my **family**	1	2	3	4	5	6	7
18. I feel strong ties with my **family**	1	2	3	4	5	6	7

STATEMENTS	Not at all						Very much
19. I feel a sense of belonging to my **ethnic/cultural group**	1	2	3	4	5	6	7
20. I identify with my **ethnic/cultural group**	1	2	3	4	5	6	7
21. I feel strong ties with my **ethnic/cultural group**	1	2	3	4	5	6	7

22. Thinking about the responses you have given, are there particular things about your social groups that make you feel that you belong?

23. Thinking about the responses you have given, are there particular things about your social groups that make you feel that you *don't* belong?

Appendix B

Psychological Sense of School Membership

Circle the answer for each statement that is most true for you.

STATEMENTS	**Not at all true**				**Completely true**
1. I feel like a part of my school	1	2	3	4	5
2. People at my school notice when I am good at something	1	2	3	4	5
3. It is hard for people like me to be accepted at my school	1	2	3	4	5
4. Other students in my school take my opinion seriously	1	2	3	4	5
5. Most teachers at my school are interested in me	1	2	3	4	5
6. Sometimes I feel as if I don't belong in my school	1	2	3	4	5
7. There is at least one teacher or adult I can talk to in my school if I have a problem	1	2	3	4	5
8. People at my school are friendly to me	1	2	3	4	5
9. Teachers here are not interested in people like me	1	2	3	4	5
10. I am included in lots of activities at my school	1	2	3	4	5
11. I am treated with as much respect as other students in my school	1	2	3	4	5
12. I feel very different from most other students at my school	1	2	3	4	5
13. I can really be myself at my school	1	2	3	4	5
14. Teachers at my school respect me	1	2	3	4	5
15. People at my school know that I can do good work	1	2	3	4	5
16. I wish I were in a different school	1	2	3	4	5
17. I feel proud to belong to my school	1	2	3	4	5
18. Other students at my school like me the way I am	1	2	3	4	5

Appendix C

The Revised Green et al. Paranoid Thoughts Scale (R-GPTS), Part B

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

Think about the last month and indicate the extent of these feelings from **0 (Not at all) to 4 (Totally)**. (Please do not rate items according to any experiences you may have had under the influence of drugs)

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

Appendix D

The Rosenberg Self-Esteem Scale (RSES)

Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

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

Appendix E

Self-Concept Clarity

Please indicate how you feel about each statement, from **1 (strongly disagree) to 5 (strongly agree)**

STATEMENTS	**Strongly Disagree**				**Strongly Agree**
1. My beliefs about myself often conflict with one another.	1	2	3	4	5
2. On one day I might have one opinion of myself and on another day I might have a different opinion.	1	2	3	4	5
3. I spend a lot of time wondering about what kind of person I really am.	1	2	3	4	5
4. Sometimes I feel that I am not really the person that I appear to be.	1	2	3	4	5
5. When I think about the kind of person I have been in the past, I'm not sure what I was really like.	1	2	3	4	5
6. I seldom (rarely) experience conflict between the different aspects of my personality.	1	2	3	4	5
7. Sometimes I think I know other people better than I know myself.	1	2	3	4	5
8. My beliefs about myself seem to change very frequently.	1	2	3	4	5
9. If I were asked to describe my personality, my description might end up being different from one day to another day.	1	2	3	4	5
10. Even if I wanted to, I don't think I could tell someone what I'm really like.	1	2	3	4	5
11. In general, I have a clear sense of who I am and what I am.	1	2	3	4	5
12. It is often hard for me to make up my mind about things because I don't really know what I want.	1	2	3	4	5

Appendix F

Sociodemographic Information

1. **What is your age?** _____ years _____ months

2. **What gender category fits you best?**
   - ☐ Male
   - ☐ Female
   - ☐ Trans female / trans woman
   - ☐ Trans male / trans man
   - ☐ Gender queer
   - ☐ Prefer not to say
   - ☐ Other (please state) _____

3. **Please indicate your ethnicity using the category that best describes you:**
   - ☐ White
   - ☐ Mixed / multiple ethnic groups
   - ☐ Asian / Asian British / Asian American
   - ☐ Black / African / Caribbean / African American / Black British
   - ☐ Other Ethnic group
   - ☐ Prefer not to say

4. **What is your country of birth?** _____

5. **What school year are you in?**
   - ☐ Year 9
   - ☐ Year 10
   - ☐ Year 11
   - ☐ Year 12
   - ☐ Year 13

6. **Do you have any mental health or neurodevelopmental conditions confirmed by a doctor? (e.g., depression, anxiety, ADHD, Autism)**
   - ☐ Yes
   - ☐ No

If yes, please list all that you know about

_____

Do you take any medication for a mental health condition? If so, what mental health condition do you take medication for?

_____

7. **Compared to your friends, is your family richer, about the same, or poorer?**
   - ☐ Richer
   - ☐ Poorer
   - ☐ About the same
   - ☐ Don't know

Appendix G

Information Sheet (Adolescents)

Adolescent participant Information Sheet

Research Study: Adolescents Thoughts and Feelings About Other People Over Time

ROYAL HOLLOWAY UNIVERSITY OF LONDON

Hello, my name is Holly. I'm a Trainee Clinical Psychologist at Royal Holloway University. I'm carrying out this research as part of my doctoral training and I would like to invite you to take part.

Before you decide if you would like to take part or not, please read **both sides** of this sheet.

What is the study about?

This study aims to explore adolescent's feelings of everyday mistrust towards others, factors that influence it, and how it changes over time.

Understanding mistrust in adolescence may help professionals develop useful ways to support adolescents who struggle with their thoughts and feelings.

Do I have to take part?

No, it is entirely up to you. I have sent your parent/carer information about the study too. If you're 13-15 years old, your parent/carer has have given permission for you to be invited. If you're 16+ years old, you can consent to take part without needing your parent/carers permission.

If you decide to take part but stop completing the questions partway through, I will keep the responses you have provided so far. If you want all of your data to be withdrawn you can request this by contacting the researcher. You can choose to withdraw from the study before the 31st March 2024 without giving a reason.

What information will be collected?

Your responses to the questionnaires and to questions about yourself, such as your age, gender and ethnicity.

Instead of using your name on the questionnaires, I will ask you to use an ID number. Please keep this ID safe as you will need this at all three time points.

All information about you will be stored confidentially and questionnaires will be kept securely and away from any identifying information.

What will I be asked to do?

If you want to take part in this study, you will be asked to complete a set of questionnaires which look at:

- Mistrust towards others
- Beliefs about yourself and others
- How much you feel you belong to various social groups
- Loneliness
- Self-esteem

Completing the questionnaires will take approximately 20 minutes.

I would like to do this on three different occasions. This means I will attend your school 3 times with one month's gap between each visit.

Who will have access to my information?

Members of the research team and responsible members at Royal Holloway University will be given access to anonymised data about you.

The results of this study will be written as a Doctoral thesis by the researcher.

The anonymised data and results may be publicly shared in an academic journal and reported in conference presentations.

Any results reported on will contain only group data and no individual, identifiable information will be included.

More information about how your responses will be kept and used can be found overleaf.

Version 5, Nov 2023

Please turn over...

Are there any disadvantages to taking part?

Thinking about difficult thoughts, feelings or experiences could be distressing to some people. It is not unusual to feel difficult emotions when thinking about experiences in our lives.

To look after yourself during or after the study you can:

- Leave questions you find upsetting blank.
- Decide to stop taking part at any time.
- Speak to a teacher or trusted adult at school.
- Ask the researcher for signposting to support.
- Speak to your parent/carer.
- Contact your GP.
- Speak to Samaritans (116 123) 24-hour support service.

Are there any benefits to taking part?

Taking part may help us to understand how adolescents are thinking and feeling and what factors predict difficult periods. It may also help us know how best to support young people with their mental health and well-being.

To thank you for taking part you will be entered into a prize draw to win a £25 voucher. I have also offered to facilitate a session related to Psychology at your school.

What if there is a problem?

If you are unsure about something whilst taking part, you can speak to the researcher, the researcher's supervisor (details below), or your teacher (who will inform the researcher).

If you have a concern about any aspect of the study, please contact Royal Holloway's Research Ethics Committee (ethics@rhul.ac.uk). If you wish to make a formal complaint, please email integrity@rhul.ac.uk.

GDPR and Data Protection Information

Royal Holloway, University of London, is the sponsor for this study. We will be using information from you to undertake this study and will act as the 'data controller' for this study. This means that this organisation is responsible for looking after your information and using it properly. Any data provided during the study will be stored securely on local servers. We will keep your responses to questionnaires for 5 years after the study has finished. After this time, we will securely destroy all data.

To safeguard your rights, we will use the minimum personal data necessary to achieve our research study objectives. The University will not do anything with your personal data that you would not reasonably expect. Any personal data collected will be used only for the purpose of carrying out the research and will be handled according to the University's policies in line with data protection law. Identifiable information about you will be kept for certain individuals from the university who may look at the research records to check the accuracy of the research study.

You can find out more about your rights under the GDPR and Data Protection Act 2018 by visiting https://www.royalholloway.ac.uk/about-us/more/governance-and-strategy/data-protection/. If you need further assistance or wish to exercise your rights, please contact dataprotection@royalholloway.ac.uk.

Thank you for taking the time to read this information sheet!

If you would like to take part, please read and sign the consent form.

Researcher: Holly Taylor (Holly.Taylor.2021@live.rhul.ac.uk)

Supervisor: Dr Jess Kingston (jessica.kingston@rhul.ac.uk)

All researchers are DBS checked

Appendix H

Adolescent Consent/Assent Form

Study Title: Adolescents thoughts and feelings about other people over time

Research ID:……

Please read the following statements and indicate your response to each statement.

I confirm that I have read and understood the information sheet	Yes / No
I have had the opportunity to ask questions about this study	Yes / No
I understand my participation in this study is voluntary	Yes / No
I understand that I am free to withdraw from the study before the 31st March 2024, without giving a reason and without detriment to myself	Yes / No
I understand that my data will be securely stored with the responses of other participants and stored for 5 years	Yes / No
I understand and agree that the anonymised electronic database will be shared with other researchers, but my privacy will be protected	Yes / No
I understand and agree that non-identifiable, anonymised data may be shared publicly if the findings are published	Yes / No

I consent / do not consent (please circle) to taking part in the research being conducted by Holly Taylor (Trainee Clinical Psychologist).

Name of Participant: ……

Date: ……

Signature: ……

Name of Person Taking consent (Researcher):……

Date: ……

Signature: ……

Appendix I

Parent/Carer Information Sheet and Consent Form

A research study to explore adolescents' thoughts and feelings about other people over time

Hello, my name is Holly, and I am a Trainee Clinical Psychologist at Royal Holloway University. I am carrying out this research project as part of my doctoral training and I would like to invite your child to take part. I have spoken to your child's school, and they have given me permission to contact you.

Please read the information below carefully, and if you are happy for your child to take part in my study, please sign the consent form provided. If there is anything you would like to know more about or that isn't clear, you can contact me using the details at the end of this information sheet.

1. **What is the study about?**

I am doing a study with adolescents to understand the thoughts that they have about themselves and others over time. I'm interested in understanding adolescent's feelings of everyday mistrust towards others and what factors might underpin mistrust (e.g., feelings about oneself and others, friendships etc.). This is an area that requires further research and may be used to develop ways of supporting young people with their mental health and well-being. I will use questionnaires to explore:

- Mistrust towards others
- Sense of belonging to various social groups
- Beliefs about themselves and others
- Loneliness
- Self-esteem

2. **Why has your child been asked to participate?**

I am asking adolescents between 13- and 18-years-old, living in the UK and fluent in English if they would like to take part in this study. Adolescents in your child's year group have also been invited to take part, and their parents/caregivers have also been sent this information.

3. **Do they have to take part?**

No, the information sheets are designed to help you and your child decide.

- If your child is **13-15 years old, they will need your parental consent to be invited to take part**. Therefore, if you would like your child to be invited, please sign and return the consent form. If you do not complete and return the consent form, it will be assumed that you do not wish for your child to be invited to take part in the study. 13–15-year-olds without parental consent will not be able to take part.
- **If your child is 16-18 years old, they can give their full consent to participate in the research without needing parental consent.** This information sheet is to inform you of the research.

In both cases, your child will also be given a consent form which they should only sign if they wish to take part in the study. This decision will have no impact on their schoolwork. Consent to take part can be withdrawn before the 31st March 2024, without giving a reason.

If consent is not given for participation in the study by either yourself or your child, their teacher will allocate them another task. Therefore, some students may decide to participate but this doesn't mean the whole class has to.

4. What will they be asked to do?

They will be asked to complete a set of questionnaires during an allocated lesson at school, in their classroom, along with other children who have chosen to take part. I would ask them to do this on three different occasions, which means I will attend three of their lessons with one month's gap between each visit. The questionnaires will take approximately 20 minutes to complete. A teacher and I will be present to facilitate the sessions and offer help. This has been arranged with your child's school and they will not miss out on lessons by participating.

5. What are the benefits to taking part?

This research may help us learn more about the effects of young people's thoughts and feelings about other people over time. The findings could help professionals predict and find ways to support adolescents who struggle with their thoughts and feelings. Adolescent's involvement in this study to improve our understanding is very important. I hope that they will find participating a useful and interesting experience. To thank the school and your child for taking part I have offered:

- A food-based incentive for the class at the end of the research session.
- A prize draw where participants can win a £25 Love2Shop voucher.
- To facilitate a group session related to Clinical Psychology.

6. What are the disadvantages or risks?

With any study there are risks we know about, risks we don't know about, and risks we don't expect. Thinking about difficult thoughts, feelings and experiences could be distressing to some people. It is not unusual to feel difficult emotions when thinking about situations and experiences in our lives. If your child experiences any difficulties or has any concerns about their well-being, I will signpost them to:

- Speak to their parent/carer.
- Speak to their teacher who can talk to them about any procedures their school has to support their mental well-being.
- Access a 24-hour support service through the Samaritans (116 123).
- Contact their GP.

Your child can leave any questions blank that they find uncomfortable or upsetting to answer and stop the study at any time, without giving a reason.

7. What information will be collected about your child?

As mentioned above, I will collect data from your child using the same questionnaires at all three time points. I will also ask some individual demographic questions, such as their age, gender, and ethnicity. This data is being collected to help me describe the sample of people who completed the study and to help me to carry out the aims of the study.

8. What happens with the information collected?

All information will be stored confidentially – your child will be given a unique ID number and will be asked not to put their name on any information. Any paper questionnaires will be kept securely and away from any identifying information. You or teachers will not be able to access your child's individual responses. I will be able to match ID numbers to names – this is to make sure that I can remove information from the research if you or your child withdraws consent, to tie up your child's data at all three data points, and for the prize draw.

All the data collected will be stored in a secure electronic database and there will be no personally identifying data stored in this database (e.g., name, date of birth etc.). Only members of the research team from Royal Holloway University will have access to the database. All members of the research team are DBS checked. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to the anonymised data. All these people have a duty to keep the information safe. The consent form will also ask your permission to share the Database with other researchers. We will transfer this data with a similar level of data protection as required under UK law.

9. What happens if I or my child changes their mind?

Your child can choose to withdraw from the study at any point without giving reason. You can also request this too. If either of you want their data to be withdrawn, their data will be removed from the research. You or your child can request this before 31st March 2024 by emailing the researcher using the contact details below with your child's ID number. The decision to withdraw at any point will not affect your child's relationship with Royal Holloway University or any other organisations.

10. What will happen to the results of the research?

When the research is completed, I will offer the school a summary of my findings which can be shared with you. The results of the study will also be written as a Doctoral thesis as part of my training. The anonymised data and results may be publicly shared in an academic journal and/or reported in conference presentations. Any results reported on will contain only group results (rather than individual responses) and no identifiable information will be included.

11. Who can I contact for questions or if I want more information?

If you would like to speak to me or have any concerns about any aspect of this study, please contact the principal investigator (holly.taylor.2021@live.rhul.ac.uk) or Royal Holloway's Research Ethics

Committee via ethics@rhul.ac.uk. If you wish to make a formal complaint, please email integrity@rhul.ac.uk.

12. Important General Data Protection Information (GDPR)

Royal Holloway, University of London is the sponsor for this study and is based in the UK. We will be using information from your child 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 child's information and using it properly. Any data your child provides during the completion of the study will be stored securely on local servers.

Royal Holloway is designated as a public authority and in accordance with the Royal Holloway and Bedford New College Act 1985 and the Statutes which govern the College, we conduct research for the public benefit and in the public interest. Royal Holloway has put in place appropriate technical and organisational security measures to prevent your child's personal data from being accidentally lost, used or accessed in any unauthorised way or altered or disclosed. Royal Holloway has also put in place procedures to deal with any suspected personal data security breach and will notify you and any applicable regulator of a suspected breach where legally required to do so.

To safeguard your child's rights, we will use the minimum personally-identifiable information possible. The lead researcher will keep your child's details confidential and will use this information only as required (i.e., to provide a summary of the study results if requested, to tie up your child's three data points, and for the prize draw). The lead researcher will keep information about your child and data gathered from the study for 5 years after the study has finished. Certain individuals from RHUL may look at your child's research records to check the accuracy of the research study. If the study is published in a relevant peer-reviewed journal, the anonymised data may be made available to third parties. The people who analyse the information will not be able to identify your child.

You can find out more about your rights under the GDPR and Data Protection Act 2018 by visiting https://www.royalholloway.ac.uk/about-us/more/governance-and-strategy/data-protection/ and if you wish to exercise your rights, please contact dataprotection@royalholloway.ac.uk

Thank you for taking the time to read the information sheet.

Please complete and return the consent form attached if your child is between 13-15 years old.

Contact details:

Researcher: Holly Taylor (Holly.Taylor.2021@live.rhul.ac.uk)

Supervisor: Dr Jess Kingston (jessica.kingston@rhul.ac.uk)

All researchers are Disclosure and Barring Service (DBS) checked.

PARENT/CARER CONSENT FORM FOR CHILDREN AGED 13-15 YEARS OLD

Study Title: Adolescents thoughts and feelings about other people over time.

Please read the following statements and indicate your response to each statement.

I confirm that I have read and understood the information sheet	Yes / No
I have had the opportunity to ask questions about this study (via emailing Holly.Taylor.2021@live.rhul.ac.uk)	Yes / No
I understand that I am being asked to consent to my child being invited to take part in this study	Yes / No
I understand that my child will be free to withdraw from the study before the 31st March 2024, without giving a reason and without detriment to them	Yes / No
I understand that a non-identifiable version of my child's data will be added to a secure database of other responders and stored for 5 years	Yes / No
I understand that the anonymised electronic database will be shared with other researchers, but confidentiality will be protected	Yes / No
I understand and agree that non-identifiable, anonymised data may be shared publicly if the findings are published	Yes / No

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I **consent / do not consent** (please circle) to my child taking part in the research being conducted by Holly Taylor (Trainee Clinical Psychologist).

Signature of parent / guardian ……

Name of parent/guardian (please print) ……

Name of child ……

Date ……

Appendix J

School Information Sheet and Consent Form

A research study to explore adolescents' thoughts and feelings about other people over time

Hello, my name is Holly, and I am a Trainee Clinical Psychologist at Royal Holloway University. I am carrying out this research project as part of my doctoral training. I am recruiting schools for my study so I can invite adolescents aged 13-18 years old to take part.

Before you decide if you would like your school to take part or not, please read the information below. If there is anything you would like to know more about or that isn't clear, you can contact me using the details at the end of this information sheet.

1. **What is the research study about?**

I am doing a study with adolescents to understand the thoughts that they have about themselves and others over time. I'm interested in understanding adolescent's feelings of everyday mistrust towards others and what factors might underpin mistrust (e.g., feelings about oneself and others, friendships etc.). This is an area that requires further research and may be used to develop ways of supporting young people with their mental health and well-being. I will use questionnaires to explore:

- Mistrust towards others
- Sense of belonging to various social groups
- Beliefs about themselves and others
- Loneliness
- Self-esteem

2. **What does the study involve?**

Adolescents who consent to take part in the study, will be asked to complete a set of paper and pen questionnaires during an allocated lesson at school (e.g., PHSCE). I would visit the class on three different occasions, which means I will attend three lessons with one month's gap between each visit. The questionnaires will take approximately 20 minutes to complete each time. I will come to the school to facilitate the session; however, I request that a class teacher is present throughout. The adolescents must complete the measures by themselves without discussing them with their peers.

3. **Consent procedures**

If, having read this information sheet, you would like your school to participate, you will need to sign the consent form attached. If your school is willing to participate, then information sheets will be sent home to parents/carers. Parents/carers will have the opportunity to say if they do or do not wish for their child to be invited to take part. For 13–15-year-olds, only the children of parents/carers who have responded and consented for their child to take part will be invited to participate. If parents/carers do not respond it will be assumed that they do not consent for their child to be invited to take part. For

16–18-year-olds, though their parent/carer will be informed of the study, the young person can give their full consent to participate in the research independently of their parent/carer.

Pupils who are invited to take part will also be given an adolescent friendly information sheet to read and consider whether they would like to take part. If they would like to take part, they will also be asked to complete a consent form.

For pupils who are not invited to take part or do not wish to take part I would request that their class teacher allocates them another task. Therefore, classes can still be involved in the study even if some pupils or parents/carers decide not to participate.

4. Are there any benefits?

This research may help us learn more about the effects of young people's thoughts and feelings about other people over time. The findings could help professionals predict and find ways to support adolescents who struggle with their thoughts and feelings. Involvement in this study to improve our understanding is very important. I hope that you and your pupils will find participating a useful and interesting experience. If your school decided to be involved in the research, I would offer:

- A food-based incentive for the class at the end of the research session.
- A prize draw where participants can win a £25 Love2Shop voucher.
- To facilitate a group session related to Clinical Psychology.

5. Are there any disadvantages or risks?

With any study there are risks we know about, risks we don't know about, and risks we don't expect. Thinking about difficult thoughts, feelings and experiences could be distressing to some people. It is not unusual to feel difficult emotions when thinking about situations and experiences in our lives. If your pupils experience any difficulties or have any concerns about their well-being, I will signpost them to:

- Speak to their parent/carer.
- Speak to their teacher who can talk to them about any procedures their school has to support their mental well-being.
- Access a 24-hour support service through the Samaritans (116 123).
- Contact their GP.

They can also leave any questions blank that they find uncomfortable or upsetting to answer and stop the study at any time, without giving us a reason.

6. What information will be collected?

I will collect data from your pupils using the same questionnaires at all three time points. We will also collect sociodemographic information in the first session.

7. What happens with the information collected?

All information will be stored confidentially – each pupil will be given a unique ID number and will be asked not to put their name on any information. Any paper questionnaires will be kept securely and

away from any identifying information. You will not be able to access pupils' individual responses, nor will their parents/carers. I will be able to match ID numbers to names – this is to make sure that I can remove information from the research if a pupil and/or their parent/caregiver withdraws consent, to tie up each pupil's data at all three data points, and for the prize draw.

All the data collected will be stored in a secure electronic database and there will be no personally identifying data stored in this database (e.g., name, date of birth etc.). Only members of the research team from Royal Holloway University will have access to the database. All members of the research team are DBS checked. Individuals from regulatory authorities (people who check that we are carrying out the study correctly) may require access to the anonymised data. All these people have a duty to keep the information safe.

8. Can pupils change their minds?

Your pupils and/or their parent/caregiver have the right to change their mind and withdraw from the study before the 31st March 2024 without giving a reason. If the adolescent stops completing the questions partway through, I will retain the responses they have provided so far unless they request for their data to be withdrawn. Pupils and parents/caregivers can request for their data to be withdrawn by emailing the me with the pupils ID number. If data is withdrawn from the study, both identifiable and non-identifiable data will be removed.

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

When the research is completed, I will offer the school a summary of my findings which can be shared with pupils and/or parents/carers. You will be able to see the group results to which your school has contributed and learn more about the topic. The results of the study will also be written as a Doctoral thesis as part of my training. The anonymised data and results may be publicly shared in an academic journal and/or reported in conference presentations. Any results reported on will contain only group results (rather than individual responses) and no identifiable information will be included.

10. Who can I contact for questions or if I want more information?

If you would like to speak to me or have any concerns about any aspect of this study, please contact the principal investigator (holly.taylor.2021@live.rhul.ac.uk) or Royal Holloway's Research Ethics Committee via ethics@rhul.ac.uk. If you wish to make a formal complaint, please email integrity@rhul.ac.uk.

11. Important General Data Protection Information (GDPR)

Royal Holloway, University of London is the sponsor for this study and is based in the UK. We will be using information from your pupils 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 pupil's information and using it properly. Any data your pupils provide during the completion of the study will be stored securely on local servers.

Royal Holloway is designated as a public authority and in accordance with the Royal Holloway and Bedford New College Act 1985 and the Statutes which govern the College, we conduct research for the public benefit and in the public interest. Royal Holloway has put in place appropriate technical and

organisational security measures to prevent your pupil's personal data from being accidentally lost, used or accessed in any unauthorised way or altered or disclosed. Royal Holloway has also put in place procedures to deal with any suspected personal data security breach and will notify you and any applicable regulator of a suspected breach where legally required to do so.

To safeguard your pupil's rights, we will use the minimum personally-identifiable information possible. The lead researcher will keep your pupil's details confidential and will use this information only as required (i.e., to provide a summary of the study results if requested, to tie up your pupil's three data points, and for the prize draw). The lead researcher will keep information about your pupil's and data gathered from the study for 5 years after the study has finished. Certain individuals from RHUL may look at your pupil's research records to check the accuracy of the research study. If the study is published in a relevant peer-reviewed journal, the anonymised data may be made available to third parties. The people who analyse the information will not be able to identify pupils.

You can find out more about your rights under the GDPR and Data Protection Act 2018 by visiting https://www.royalholloway.ac.uk/about-us/more/governance-and-strategy/data-protection/ and if you wish to exercise your rights, please contact dataprotection@royalholloway.ac.uk

Thank you for taking the time to read the information sheet and considering involvement in the study.

Contact details:

Researcher: Holly Taylor (Holly.Taylor.2021@live.rhul.ac.uk)

Supervisor: Dr Jess Kingston (jessica.kingston@rhul.ac.uk)

All researchers are Disclosure and Barring Service (DBS) checked.

Headteacher Consent Form

Study Title: Adolescents thoughts and feelings about other people over time.

Please read the following statements and indicate your response to each statement.

I confirm that I have read and understood the information sheet	Yes / No
I have had the opportunity to ask the researcher questions about this study	Yes / No
I understand that I am being asked to consent to students from my school being invited to take part in this study	Yes / No
I understand that pupils will be free to withdraw from the study before the 31st March 2024, without giving a reason and without detriment to them	Yes / No
I understand that a non-identifiable version of pupil's data will be added to a secure database of other responders and stored for 5 years	Yes / No
I understand that the anonymised electronic database will be shared with other researchers, but confidentiality will be protected	Yes / No
I understand and agree that non-identifiable, anonymised data may be shared publicly if the findings are published	Yes / No

I **consent / do not consent** (please circle) to my school taking part in the research being conducted by Holly Taylor (Trainee Clinical Psychologist).

Signature of head teacher ……

Name of head teacher……..

Date ……

Appendix K

Debriefing Information

Study Title: Adolescents thoughts and feelings about other people over time

What is the study about?

Thank you for taking part in the study. This study aimed to explore mistrust and suspicion in adolescents over time. Most people feel mistrusting or suspicious of other people at some point in their lives. Whilst research has looked at this quite a bit in adults, there isn't much research on young people. I looked at mistrust towards others and how it is influenced by:

- Beliefs about yourself and others
- Your sense of belonging to various social groups (i.e., with friends, at school, in your hometown etc.)
- Loneliness
- Self-esteem
- How consistent and stable your beliefs about yourself are

I hope to learn how these factors relate to mistrust and suspicion in young people over time. I also want to explore how some of these things might increase or decrease someone's likelihood to feel suspicious and mistrusting of others.

What are the benefits?

Taking part in this study will contribute to our understanding of how young people are thinking and feeling during adolescence. This may help us develop useful ways to help people who are feeling suspicious of others and who are distressed by this experience. Therefore, your completion of the questionnaires is important, and much appreciated.

Any further questions/contact details?

Please feel free to contact me via email (holly.taylor.2021@live.rhul.ac.uk)

If this study has negatively impacted your mood or if you have any concerns about your well-being, you can:

- Contact mental health charity MIND (0300 123 3393 or text 86463) or the Samaritans (116 123).
- Contact your GP.
- Speak to your teacher about what mental well-being support is available at your school.

Please remember that you are free to withdraw from the study before the 31st March 2024 without giving a reason.

Thank you!

Appendix L

Ethical Approval

Royal Holloway
University of London
Egham, Surrey
TW20 0EX

FAO: Holly Taylor

10th May 2023

Dear Holly,

I can confirm that project ID number 3550 entitled 'The adolescent experience of paranoia: role of social identity and self-esteem.' was originally approved by the Research Ethics Committee via the full ethical review process on the 3rd May 2023. An amendment request was approved on the 27th of November 2023, the reason for the amendment were:

- Change to participant groups
- Change to participant documents
- Change to research methods
- Change to research summary

Please report any subsequent changes that affect the ethics of the project to the University Research Ethics Committee ethics@rhul.ac.uk. If you require amendments to the study, please complete and amendment request form and return to ethics@rhul.ac.uk

Yours sincerely,

Professor Robert Jago
Research Ethics Lead