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# Conspiracy theory beliefs in the adolescent population: A systematic review

Anthony Byrne  | David Martin | Claire Jones | Niall Galbraith | Tom Mercer

School of Psychology, Faculty of Education, Health, and Wellbeing, University of Wolverhampton, Wolverhampton, UK

## Correspondence

Anthony Byrne, School of Psychology, Faculty of Education, Health, and Wellbeing, University of Wolverhampton, Wulfruna St, Wolverhampton WV1 1LY, UK.  
Email: [A.J.Byrne@wlv.ac.uk](mailto:A.J.Byrne@wlv.ac.uk)

## Abstract

**Introduction:** While the study of conspiracy theory beliefs is a relatively new research area, there has been a rise in academic interest in recent years. The literature provides evidence of relationships between conspiracy theory beliefs and a range of factors, but the vast majority of studies are limited to adult samples, and it is unclear how such beliefs present in adolescence.

**Methods:** The systematic review was conducted according to the PRISMA-S format. Relevant databases were searched up to February 23, 2023, for quantitative studies related to adolescent conspiracy theory beliefs.

**Results:** The six included articles show that conspiracy theory beliefs are present from the start of adolescence, and stable from age 14 upwards, with correlations reported for mistrust and paranoid thinking. Negative relationships were reported for cognitive factors such as ontological confusion, cognitive ability, and actively open-minded thinking. Health-related beliefs correlated with adverse childhood experiences, peer problems, conduct, and sociodemographic factors. Right-wing authoritarianism and anxiety positively correlated with intergroup conspiracy theory beliefs.

**Conclusion:** While some factors from adult studies are replicated in the review, there are differences between age groups. The age at which conspiracy theory beliefs begin to form indicate developmental aspects of adolescence, and possibly childhood, that require further examination. Cognitive factors show promise for interventions and should be explored further. However, the lack of studies using adolescent populations is an issue that must be resolved for a greater understanding of conspiracy theory beliefs and a move toward effective interventions.

## KEYWORDS

adolescent, cognition, conspiracy, personality, review, systematic

## 1 | INTRODUCTION

While conspiracy theories have been common-place throughout history (Aaronovitch, 2009), advances in global data sharing have allowed for new online platforms to emerge that enable novel methods for the spread of information related to conspiracy theories (Dow et al., 2021; Röchert et al., 2022). Given the tendency for individuals to discard their own judgment in favor of information collected from media sources, and the underestimation of how much conspiratorial arguments can influence individual attitudes (Davison, 1983; Douglas & Sutton, 2008), it is unsurprising that conspiracy theories continue to be common. In the literature, belief in conspiracy theories is generally considered undesirable and associated with societal harms, such as political polarization, vaccine hesitancy, property destruction, and the potential for violence (Allington et al., 2021; Jolley & Douglas, 2014; Jolley & Paterson, 2020; Kofta & Soral, 2020). But despite the negative connotations, academics have also argued that belief in conspiracy theories might be beneficial from an evolutionary point of view

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(Van Prooijen & Van Vugt, 2018), indicating that suspiciousness of conspiracy behaviors in others could potentially benefit individuals or groups by promoting protective behaviors.

Despite ongoing epistemological debate regarding classification and definition (Duetz & Dentith, 2022), empirical researchers generally define conspiracy theories as a belief that global events are manipulated by small groups of actors, with the intent to carry out covert malevolent acts (Swami et al., 2011). A wide range of factors are associated with belief in conspiracy theories, including personality traits (March & Springer, 2019), cognitive factors (Jones et al., 2023), stress (Swami et al., 2016), epistemic processes (Douglas et al., 2016; Leman & Cinnirella, 2013), intergroup threat (Imhoff & Bruder, 2014), analytic thinking (Pytlík et al., 2020; Swami et al., 2014), and group identity (Cichočka et al., 2015). However, while much is now known about the endorsement of conspiracy theories in adult populations, very little information is available on how such beliefs begin to form before adulthood. Studies using university student populations, which usually have a high number of participants aged 18–24 years, report no difference in conspiracy theory beliefs in relation to age (Cookson et al., 2021; Swami et al., 2014), indicating that such beliefs are already prevalent during early adulthood. Therefore, understanding the cognitive mechanisms affecting belief in conspiracy theories among the adolescent population is important given that adolescence is a developmental stage characterized by cognitive malleability (Kadosh et al., 2013). Understanding these mechanisms could provide an opportunity to potentially improve how adolescents view and process the information they gather and how they respond to it.

When considering potential developmental correlates of belief in conspiracy theories, a number of factors are salient. Childhood and adolescent cognitive dysfunction, associated in the literature with dopamine dysregulation (Wahlstrom et al., 2010), is associated with schizotypal traits and paranoid ideation (Barnby et al., 2020; Mohr & Ettinger, 2014), both of which are related components of subclinical delusional thinking (Heilskov et al., 2020). Early adverse life events can affect dopaminergic function during childhood, a period of rapid neural development (Smith & Pollak, 2020) and has been reported to predict delusional thinking in the general population (Green & Webster, 2022). Given that schizotypy, paranoid thinking and delusional thinking are reported as present during the adolescent phase (Carvalho et al., 2019; Fonseca-Pedrero et al., 2008; Heins et al., 2019), are correlated with belief in conspiracy theories in adult samples (Barron et al., 2014; Dagnall et al., 2015; Darwin et al., 2011), and that unique dopamine modulation and dysregulation is shown to present during adolescence (Reynolds & Flores, 2021; Wahlstrom et al., 2010), it is possible that conspiracy beliefs may begin to form during this period.

Additionally, analytical thinking, critical thinking, and scientific reasoning, described as a nested, lower to higher order structure (Gjoneska, 2021), are negatively correlated with conspiracy theory beliefs in adults (Georgiou et al., 2021; Pennycook et al., 2020; Swami et al., 2014; Van Prooijen, 2017). As adolescence provides a period where formal logical operations develop (Klaczynski et al., 1998), an understanding of how cognitive ability affects either the occurrence or lack of belief in conspiracy theories in adolescence could provide a better understanding of lifespan conspiracy belief development and inform directions for intervention. Likewise, actively open-minded thinking, characterized by Swami et al. (2014, p. 574) as “flexibility, outward seeking of knowledge, and openness” is reported to reduce beliefs in generic conspiracies. As actively open-minded thinking is present from early adolescence (Emlen Metz et al., 2020), it has potential for use in interventions.

A number of intervention strategies relating to belief in conspiracy theories have been explored using adult populations. In a systematic review by O'Mahony et al. (2023), priming was shown to have potential as a strategy for lowering belief in conspiracy theories across a range of factors, including analytic thinking (Swami et al., 2014), promotion focus (Whitson et al., 2019), and resistance to persuasion (Bonetto et al., 2018). Fact and logic-based inoculation (Banas & Miller, 2013) was also shown to be a promising strategy for reducing belief in conspiracy theories, with fact-based inoculation reported as having the largest effect size in the meta-analysis. Education methods might also be beneficial in reducing belief in conspiracy theories; a longitudinal study utilizing an educational course teaching critical thinking skills about pseudoscience as a method for reducing epistemically unwarranted beliefs showed a large effect size overall, although the reported effect size for belief in conspiracy theories was small (Dyer & Hall, 2019). However, while the results of existing intervention studies are promising, it is not known whether such interventions would be more effective if carried out with adolescents, or before the age where belief in conspiracy theories begins to form.

As a result of the lack of studies focussing on belief in conspiracy theories in adolescence, an absence of knowledge related to cognitive development, and the potential for such research to guide the development of interventions, the current systematic review will explore the depth and breadth of the literature relating to the endorsement of conspiracy theories among the adolescent population to inform directions for further research.

## 2 | METHOD

The systematic review protocol was preregistered (doi:10.37766/inplasy2023.2.0109) with the International Platform of Registered Systematic Review and Meta-analysis Protocols (INPLASY) and conducted according to the Preferred Reporting Items for Systematic reviews and Meta-Analyses literature search extension (PRISMA-S) format (Rethlefsen et al., 2021).

## 2.1 | Search strategy

To find relevant literature, two independent reviewers (A. B. and D. M.) conducted a search of the SCOPUS database (Elsevier), APA PsycInfo, Psychology and Behavioral Sciences Collection, and SocIndex with Full Text databases on the EBSCOhost platform (EBSCO Industries), and the Core Collection, BIOSIS, KCI-Korean, MEDLINE, and SciELO Citation Index databases on the Web of Science platform (Clarivate). To conduct the search, the following Boolean operators were used: (adolescen\* OR teenage\* OR youth) AND (conspirac\*). The Boolean operators were chosen after preliminary experimentation with different combinations to find the optimal search results. To optimize the search, a wide date range was chosen. As each database differs in earliest available search dates, the following date ranges for each platform were used: SCOPUS (“before 1960”—February 23, 2023), EBSCOhost (1900—February 23, 2023), and Web of Science (1970—February 23, 2023). No lower date range was available for searching the EBSCOhost platform, so 1900 was chosen to maximize search results. A literature search was conducted for preprints on the PsyArXiv electronic database using the terms “adolescent” and “conspiracy” and a search of the reference lists of articles that met the inclusion criteria conducted. An additional search was conducted following the review process to identify any newly published studies relevant to the current review.

## 2.2 | Screening and inclusion criteria

Screening was carried out by two reviewers (A. B. and D. M.). Disagreements relating to the screening were resolved through discussion of the results by the reviewers. Articles were included in the systematic review if they met the following criteria: (a) quantitative, (b) directly measure belief in conspiracy theories, (c) only include adolescent participants (11–19 years), (d) were of sufficient quality, and (e) were published in the English language.

## 3 | RESULTS

The database search generated a total of 632 results (Figure 1). Identified studies extracted during the database search were recorded using Endnote 20 reference management software (version 20.4.1 Build 16297). Following removal of duplicates ( $n = 222$ ) and title screening ( $n = 296$ ), a total of 114 articles were eligible for screening of abstracts. The number of studies was further reduced by 91 articles after screening of abstracts, leaving a total of 23 studies. The remaining 23 studies were subjected to full paper screening according to the inclusion criteria. Of the 23 studies included in full paper review, 18 were excluded for the following reasons: not exclusively studying adolescent populations ( $n = 14$ ), article being unavailable ( $n = 1$ ), not using quantitative methods ( $n = 1$ ), and not being published in the English language ( $n = 2$ ).

### 3.1 | Additional studies

Following agreement on included articles, the reference lists were searched for additional studies. Only one article was identified through reference list searches of articles that met the inclusion criteria. However, following quality assessment and discussions between the reviewers, it was decided that the article would not be included due to the low AXIS score, which did not meet the inclusion criteria. The article also focussed more on the effect of conspiracy theory beliefs as an influencing factor of attitudes, rather than conspiracy theory beliefs as a dependent factor. During full screening, an additional study from a thesis was identified that was not present in the database search. After consultation between the reviewers, the study was included in the systematic review. Following full paper screening and the inclusion of the additional study, six articles were included in the current systematic review.

### 3.2 | Inclusion and exclusion review

Two of the six studies required a discussion between the reviewers regarding their inclusion due to the ages of the participants. Both studies were by the same lead author (Grzesiak-Feldman, 2007; Grzesiak-Feldman & Irzycka, 2009). The 2007 study used a population of Polish high school students aged 17–20 years ( $M = 17.8$ ,  $SD = 0.6$ ) and so did not meet the inclusion criteria related to age range (11–19 years). Following discussions between the reviewers, the study was deemed to be close enough to the eligible age range after considering the mean age and standard deviation, and the age range of high school students in Poland (up to 20 years of age for a small number of students), to necessitate inclusion. The 2009 study did not include the specific age ranges of the study population but identified the participants as Polish high school students

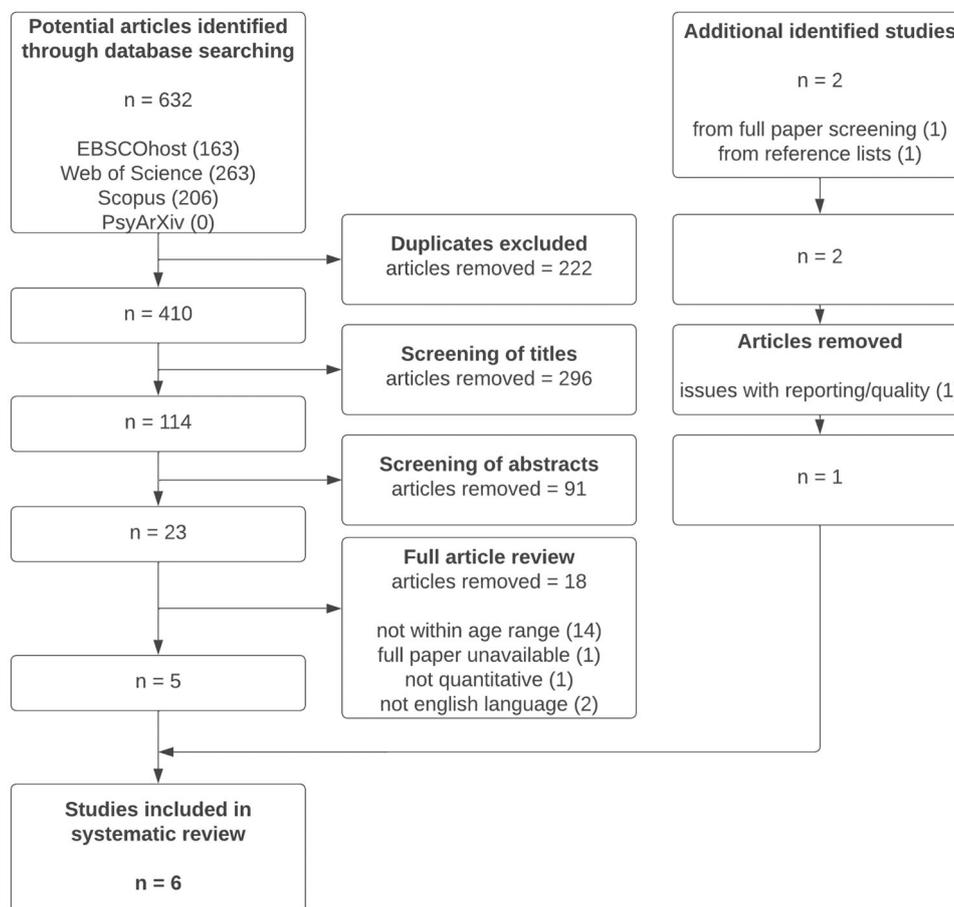


FIGURE 1 Flowchart: Systematic literature search and screening of articles.

( $M = 17.5$ ,  $SD = 0.6$ ), with the author stating that the study aimed to replicate the sample characteristics of the 2007 study. After discussions between A. B. and D. M., the 2009 study was also included in the systematic review.

### 3.3 | Data extraction

A data extraction and quality assessment form was constructed for the purpose of the review (Supporting Information: S1). Data extraction included country of origin, study type, analyses used, measures completed by participants, sample size, participant characteristics, and aims of the study (Table 1).

### 3.4 | Assessment of bias risk and study quality

To assess quality and risk of bias, the eligible articles were subjected to review using the Appraisal Tool for Cross Sectional Studies (AXIS; Downes et al., 2016). The AXIS tool comprises 20 items designed to assess the reliability of studies through the review of study design, bias, and reporting quality. The AXIS tool allows the reviewer(s) to assess each article by responding “yes,” “no,” or “don’t know,” and allows for comments to be recorded for each of the 20 items.

### 3.5 | Study quality

Study quality was assessed by assigning AXIS scores of 1 for “yes” responses, and 0 for “no” or “don’t know” responses. One AXIS question (item 19) asks whether there may be issues with funding sources or conflicts of interest, therefore a score of 1 was given for a “no” response, and 0 for “yes” or “don’t know” response. After the responses from the two reviewers were totaled and a mean score calculated, studies were categorized as “poor” for scores less than 10, “fair” for scores from 10 to 13,

**TABLE 1** Characteristics of studies included in the systematic review.

References	Properties	Objectives	Outcomes
Grzesiak-Feldman (2007)	High school students 17–20 years ( $M = 17.8$ , $SD = 0.6$ ) 118 participants	Examine effect of state-trait anxiety on conspiracy theory beliefs	Positive correlations with conspiracy theory beliefs in A-trait anxiety among males and negative correlations in females
Grzesiak-Feldman and Irzycka (2009)	High school students 17–20 years ( $M = 17.5$ , $SD = 0.6$ ) 354 participants	Examine the effect of right-wing authoritarianism on conspiracy theory beliefs	Conspiracy theory belief scores were positively correlated with right-wing authoritarianism
Hogg et al. (2017)	General population (median age 17 years) Q1–Q3: 16–18 830 participants	To examine conspiracy theory beliefs about HIV	Males, students, unemployed, and those with a HIV death in their family more likely to have HIV conspiracy theory beliefs
Jolley et al. (Study 2) (2021)	High school students 11–17 years ( $M = 14.05$ , $SD = 1.77$ ) 178 participants	Effect of age, paranoid ideation, mistrust, and extraversion on conspiracy theory beliefs	Conspiracy theory beliefs are stable from 14 years of age. Mistrust at home and paranoid ideation correlate with conspiracy theory beliefs
Goreis et al. (2023)	Psychiatry outpatients 11–18 years ( $M = 15.8$ ) 93 participants	Effect of depression, stress, childhood trauma, and emotional and behavioral problems on conspiracy theory beliefs and guideline adherence	COVID-19 conspiracy theory beliefs correlated with adverse childhood events, trauma, conduct, and peer issues. Generic beliefs were lower than adult studies using the same measure
Rizeq (Study 2) (2019)	Adolescents 12–19 years ( $M = 15.93$ , $SD = 1.25$ ) 324 participants	Effect of open-minded thinking, cognitive ability, education, and ontological confusion on conspiracy theory beliefs	Conspiracy theory beliefs correlated with open minded thinking, cognitive ability, and ontological confusion

Abbreviation: HIV, human immunodeficiency virus.

“good” for scores from 14 to 16, and “very good” for scores from 17 to 20. Of the six included studies, one was classed as “fair,” four were classed as “good,” and one was classed as “very good.”

### 3.6 | Data sources

Of the six studies in the systematic review, population samples were taken from high school students ( $n = 3$ ); Poland ( $n = 2$ ), United Kingdom ( $n = 1$ ), patients from a university psychiatric outpatients department ( $n = 1$ , Austria), online Qualtrics panel services ( $n = 1$ , North America), and residents from the general population ( $n = 1$ , South Africa). Of the three studies that used school students as samples, two studies (Grzesiak-Feldman, 2007; Grzesiak-Feldman & Irzycka, 2009) recruited Polish high school students to examine attitudes toward the Jewish community in relation to specific attitudes found in the Polish general population. While the two studies reported sample sizes of 118 and 354, respectively, it is unclear whether only one school, or a number of schools, were used for data collection. The third study using high school students (Jolley et al., 2021) recruited a sample taken from schools in two different geographical areas of the United Kingdom. The United Kingdom has a high level of ethnic diversity, and as 20.7% of the sample reported being born outside of the United Kingdom, and 19% reported that English is not their first language, the diversity in the sample indicates a higher likelihood of generalizing to the wider population.

The three remaining studies recruited samples from alternative sources to schools. One study (Hogg et al., 2017) recruited participants from townships across Soweto in South Africa. As the sample was taken from a specific geographic location, the results may not generalize to adolescents in other areas. Additionally, a small fee was paid for participation and may have led to over-representation of individuals suffering monetary disadvantage. One study (Goreis et al., 2023) took a sample from psychiatric outpatients to examine conspiracy theories in adolescents with mental health diagnoses. The authors reported that the sample represented approximately 10% of all outpatients within the department and, as such, might not be representative of all adolescents engaged with the outpatient department. The final study (Rizeq, 2019) used online panel data from Qualtrics Panels services to recruit participants from North America. Online panel data has been shown to have psychometric properties similar to traditional data collection methods, and produces credible criterion validities (Walter et al., 2019). The authors reported high levels of ethnic variability among the participants.

### 3.7 | Nonresponse

While none of the six included studies reported measures taken to address nonresponders, three of the six included studies were carried out in a school setting as part of the school day, and therefore were less likely to be prone to nonresponse (Cheung et al., 2017). Of the remaining three studies, none reported whether nonresponse was addressed, and as such it is not possible to assess whether the outcomes are affected by nonresponse bias, or if measures were taken to correct for nonresponse.

### 3.8 | Age

Five of the studies reported values for mean age and standard deviations and one study reported median and quartile range. Five of the studies reported age ranges while one study did not report the age range but did report that the participants were high school students and provided mean and standard deviation values. It should be noted that while Polish students often study until 18 years of age, some take longer to finish their education due to engaging in “Matura” A-levels while also engaged in a profession, leading to the possibility that some participants could be 20 years of age. Two of the included studies use Polish students, with one study declaring the age range to be 17–20 ( $M = 17.8$ ,  $SD = 0.6$ ), and the other study failing to give the age range but reporting mean age as 17.5 years and standard deviation as 0.6. The authors also specify that the second Polish study, which did not give the specific age range, modeled the characteristics of the 2007 study by Grzesiak-Feldman, which gave the age range as 17–20 years. Discussions took place between the reviewers as to whether to include the two Polish studies as some of the participants are up to 12 months older than the age range requirements laid out in the inclusion criteria. The reviewers agreed that, given the mean and standard deviations, and the very low numbers of students who remain in Polish education until 20 years of age (Sas, 2023), both studies should be included.

### 3.9 | Gender

All included studies reported that females were the majority gender among the participants with the highest disparity between genders reported by Rizeq (2019) as 64.5% majority female. The disparity in proportional representation between genders is important to consider. In a study by Cassese et al. (2020), it was reported that males were more likely to believe belief in conspiracy theories related to COVID-19 than females due to higher levels of conspiratorial thinking and learned helplessness. Furthermore, a study by Galliford and Furnham (2017) found males scored higher in both medical and political belief in conspiracy theories compared to females. Given that, of the six studies included in the systematic review, one relates to COVID-19, one relates to political attitudes (right-wing authoritarianism), and one examines human immunodeficiency virus (HIV) conspiracy theories, the gender disparity in the included studies should be taken into consideration.

### 3.10 | Sample size

Of the six studies included in the systematic review, only one study justified the sample size (Goreis et al., 2023), with details including software used (G\*Power), power value (80%) and  $\alpha$  level (.05). The study reported a required sample size of at least 90 participants and achieved a total of 93 participants in the analyses. Of the other five studies included in the systematic review that did not justify the sample size, the smallest sample size was 118 participants, and the largest was 830.

### 3.11 | Measures of belief in conspiracy theories

Five of the included studies used measures of belief in conspiracy theories for which validity has been reported, with all five studies reporting  $\alpha$  or  $\omega$  values. The sixth study used a single item to record conspiracy beliefs, with no validity information available. An overview of each of the conspiracy theory belief measures used in the included articles is reported below.

#### 3.11.1 | Generic Conspiracy Beliefs Questionnaire (GCBQ)

The GCBQ (Brotherton et al., 2013) is a widely used measure of generic conspiracy theory belief consisting of 15 items across five factors. Responses to the items are given using a 5-point Likert scale. The GCBS gives statements relating to generic

conspiracy theory beliefs, such as “groups of scientists manipulate, fabricate, or suppress evidence in order to deceive the public.” The GCBS has been shown to have very good reliability ( $\alpha = .93$ ; Brotherton et al., 2013).

### 3.11.2 | Adolescent Conspiracy Beliefs Questionnaire (ACBQ)

The ACBQ (Jolley et al., 2021) is a recently developed 9-item measure of generic conspiracy theory beliefs designed specifically for use with adolescent populations. The ACBQ asks participants to indicate their level of agreement to statements, such as “governments have deliberately spread diseases in certain groups of people” using a 7-point Likert scale. The ACBQ is shown to have very good reliability ( $\alpha = .90$ ; Jolley et al., 2021).

### 3.11.3 | Unwarranted Belief Scale (generic conspiracy belief domain)

The Unwarranted Belief Scale (Rizeq, 2019) measures unwarranted beliefs across three domains: paranormal beliefs, generic conspiracy beliefs, and antiscience beliefs. The generic conspiracy belief domain uses eight items adapted from the GCBQ (Brotherton et al., 2013) to measure belief in conspiracy theories in adolescents and young adults. The measure gives statements, such as, “A small secret group of people control world events” and asks participants to indicate their level of agreement using a 6-point Likert scale. Reliability for the generic conspiracy items was reported as very good ( $\omega = .89$ ; Rizeq, 2019) and tested on adolescents aged 12–19 years of age. The measure is reported in a doctoral thesis.

### 3.11.4 | 18-Item Conspiracy Beliefs Scale

The 18-item Conspiracy Belief Scale (AND & SEDEK, 2005) is reported as a measure of conspiracy thinking across three subscales: power striving, acting in conspiracy, and group egoism. The measure asks participants to respond to statements about their level of agreement regarding attitudes toward Jewish people and other nationalities such as, “members of a given nationality strive for a larger influence on the world's economy.” Participants respond using a 5-point Likert scale. Internal consistency for the measure is reported as high ( $\alpha = .84$ ; Grzesiak-Feldman & Irzyck, 2009).

### 3.11.5 | Single item HIV conspiracy measure

The single item (Hogg et al., 2017) asks participants “where do you think HIV originated/came from?” Participants are asked to choose from several dichotomous responses, including conspiracy theory-based answers, such as “from the pharmaceutical industry,” or “the U.S. government,” and the correct answer “monkeys/chimpanzees.” Participants were also given the choice to choose from “unsure” or “other.”

## 3.12 | COVID-19 conspiracy theory beliefs

One study (Goreis et al., 2023) explored the relationship between mental health, COVID-19 belief in conspiracy theories, generic belief in conspiracy theories, and adherence to pandemic-related guidelines using measures of depression, perceived stress, childhood trauma, and emotional/behavioral problems. The authors report that in the sample, endorsement of generic belief in conspiracy theories was shown to be low on the scale and lower in relation to adult studies using the same measure. For COVID-19 related conspiracy theory beliefs, 14% of respondents endorsed at least one conspiracy theory, with a mean value of 16 (0–100 range) reported across all items. Regarding guideline adherence, moderate to high levels were found in the cohort, with participants that reported higher endorsement of COVID-19 conspiracy theory beliefs adhering to guidelines less than those with lower scores. No significant relationship was reported for generic conspiracy theory belief and guideline adherence. The authors note that COVID-19 conspiracy theory belief was highly correlated with reported generic beliefs despite the lack of association between generic beliefs and adherence to guidelines. Following analysis of relationships between mental health factors and belief in conspiracy theories, the authors reported that adverse childhood experiences, peer problems, and conduct were shown to predict higher generic and COVID-19 conspiracy theory beliefs, but depression and stress did not. The authors note that some adult studies have reported relationships between depression, stress, and belief in conspiracy theories in adult samples, possibly indicating differences in the formation and presentation of conspiracy theory beliefs between age groups.

### 3.13 | HIV conspiracy theory beliefs

One study examined the relationship between sociodemographic factors and belief in conspiracy theories relating to the origins of the HIV (Hogg et al., 2017). The participants answered questions relating to knowledge of HIV and origins of the virus alongside a demographic questionnaire covering gender, age, housing, education, employment, sexual preference, food insecurity, and whether a close family member had died of HIV. Overall, 8.6% of participants endorsed belief in conspiracy theories related to HIV, with most of those believing that HIV was caused by the US government, was created by the pharmaceutical industry, or spread through a vaccine. Of the remaining participants, the authors reported participants believing that HIV came from space, or from a scientist. Only 20.2% of participants were able to identify the correct source of HIV. Regarding sociodemographic factors, participants who were more likely to believe in conspiratorial origins of HIV were male, students, or not employed, and those with a close member of the family who had died as a result of HIV. As noted by the authors, almost 1 in 10 young people aged 15–24 in South Africa are infected with HIV, and as a result, reducing belief in conspiracy theories relating to the origins of HIV through education might result in a significant increase in preventative measures through promoting correct HIV information. However, as reported in the study, data was collected in a specific geographical location and might not generalize to the wider population. Participants were also given a small amount of money for participating and thus increasing the possibility of over-representing those in need of financial assistance.

### 3.14 | Generic conspiracy theory beliefs

Two included studies assessed generic belief in conspiracy theories, both of which were part of larger studies validating newly developed measures of belief in conspiracy theories designed for use with adolescent populations (Jolley et al., 2021; Rizeq, 2019). In the first study (Jolley et al., 2021), participants completed the ACBQ alongside two measures of constructs shown in adult studies to correlate with belief in conspiracy theories: a young person's measure of paranoid thinking, and two items from a measure of mistrust—mistrust at home and mistrust at school. The study also included a construct not associated with belief in conspiracy theories in adults as part of the validation analysis process: a children's extraversion measure. During the analyses, participants were categorized by educational key stages to assess the effect of age on belief in conspiracy theories. The authors reported significantly lower conspiracy theory beliefs among key stage 3 students (11–14 years) compared with students at key stage 4 (14–16 years), and no significant difference between key stage 4 and key stage 5 (16–17 years), indicating that from the age of 14–17 years, conspiracy theory belief levels are higher and remain constant. Both paranoid thinking and mistrust at home were positively correlated with belief in conspiracy theories but mistrust at school and extraversion were found to not be significantly correlated. For the second study (Rizeq, 2019; Study 2), participants completed measures of actively open-minded thinking, cognitive reflection, ontological confusions, and cognitive ability, alongside the unwarranted belief measure, of which one domain assesses generic conspiracy theory beliefs. Participants were also asked to report their level of academic achievement. The study found generic conspiracy theory beliefs to be negatively correlated with actively open-minded thinking, ontological confusion, and cognitive ability but no significant relationship was shown for cognitive reflection or academic achievement.

### 3.15 | Intergroup conspiracy theory beliefs

Two of the included studies assessed factors relating to belief in conspiracy theories among Polish participants. The conspiracy theories used in the study were specifically about the Jewish population and were compared to beliefs within the Polish population about a range of nationalities. It should be noted that the authors appear to be comparing an ethnic group with national populations; while no rationale is given for this, it could be that among the Polish population, Jews are perceived as a nationality. This may be a limitation of the study and should be taken into consideration. In the first study (Grzesiak-Feldman, 2007), participants were asked to complete a measure containing statements about other nationalities, where only statements about Jewish populations were considered to relate to belief in conspiracy theories. The reasoning for the methodology used was the central role occupied by Jewish people in attitudes toward other nationalities among Polish populations. Also included was a measure of state anxiety and trait anxiety. While the study found no overall relationship between belief in conspiracy theories and state or trait anxiety, a follow up analysis comparing genders found a positive correlation with trait anxiety among male participants, and a negative correlation with trait anxiety among female participants. The second study (Grzesiak-Feldman & Irzycka, 2009) examined the effect of right-wing authoritarianism on belief in conspiracy theories in a Polish sample using the same measure relating to the Jewish population as the previous study (Grzesiak-Feldman, 2007). Participants responded to 12 items relating to right wing authoritarianism and completed the 18-item conspiracy beliefs scale. The study found a positive correlation between right-wing authoritarianism and belief in conspiracy theories relating to the Jewish population.

## 4 | DISCUSSION

### 4.1 | Main findings

The aim of the current systematic review was to assess the existing literature examining adolescent conspiracy theory beliefs. With only six studies utilizing a total of 1897 participants included in the review, it is clear that a great deal of work is required to move toward a more detailed understanding of belief in conspiracy theories in the adolescent population. Although small in number, the identified studies are, overall, of good quality, although there are deficits in reporting limitations and strategies for nonresponse. Most of the studies did not include justification of sample size, which is surprising as the majority of the studies were published in the last 6 years and reporting power analyses is now standard practice. However, the one study that justified sample size had the smallest sample, and the remaining studies appear to have adequate to large participant numbers. The data sources were varied, with samples being taken from North America, Europe, and Africa, and representation across the included studies was generally of good quality. Regarding the ages of the participants, the samples covered the adolescent age range, although the two Polish studies only used participants aged 17 years and upward and might have benefitted from expanding the samples to include younger adolescents.

The measures used for assessing belief in conspiracy theories were good overall, with  $\omega$  or  $\alpha$  values reported for five of the six measures. Only one measure was not validated; the study used a single question to assess the level of belief in conspiracy theories in the target population, although it should be taken into consideration that the study examined a specific medical conspiracy theory belief. Three studies utilized measures that have been used in previous research and reported as having good validity and reliability, while two studies were taken from larger studies of newly developed measures, both of which were designed for examining adolescent conspiracy theory belief. The ACBQ is a validated tool for adolescents that is freely available but was only published in 2021, and the Unwarranted Beliefs measure, developed as part of a doctoral thesis in 2019, appears to have only been used in a study of young adults. The addition of both of these new measures is a positive step for adolescent belief in conspiracy theories research as they may reduce the need for researchers to spend time and money developing their own research tool.

Despite the lack of research on belief in conspiracy theories in adolescence, the current review highlights some important relationships. Of the included studies that compared age groups within the 11–19 year age range, Hogg et al. (2017) reported no significance for age, although the age range of the study began at 14 years, meaning it is not possible to ascertain at what age HIV conspiracy theories began in the sample. Jolley et al. (2021) reported conspiracy theory beliefs to be lower at age 11–14 years (key stage 3) in comparison with those 14–16 years (key stage 4) and older, with belief in generic conspiracy theories remaining consistent in the sample from 14 years upwards. The results suggest that developmental factors might influence the uptake of such beliefs; formal logical operations begin developing in early adolescence (Klaczynski et al., 1998), and it might be possible that for adolescents whose cognitive development is delayed, affected by dysfunction, or for those with lower cognitive ability, conspiracy theory beliefs are more likely to develop during this time. Given that schizophrenia is reported to affect cognitive development and disrupt the transition from concrete operations to logical-formal thought (Torres et al., 2007), it is possible that subclinical pathological factors, such as schizotypy and delusional thinking could explain the relationship between age and belief in conspiracy theories.

With regard to comparing adult samples with those aged 11–19 years, it is difficult to ascertain from the small number of studies included in the current review the extent to which the formation or maintenance of belief in conspiracy theories differs. The study by Grzesiak-Feldman and Irzycka (2009) reported findings similar to those found in adult studies (Dyrendal et al., 2021; Krüppel et al., 2021) that show right-wing authoritarianism to predict conspiracy theory beliefs. The study used a specific conspiracy theory belief relating to Jewish people in a Polish sample, and the results could be a product of the relationship between right-wing authoritarianism, intergroup threat, and the attitudes of Polish people toward Jewish populations (Bilewicz et al., 2012; Krüppel et al., 2021). Intergroup threat can be realistic or symbolic (Stephan et al., 2016) and given the historical nature of discrimination toward the Jewish population in Poland, despite the very low numbers of Jewish people that reside there, the reported correlations could be explained, at least partially, by symbolic intergroup threat.

The included study of adolescent psychiatric outpatients by Goreis et al. (2023) reported lower beliefs among adolescents compared with adults in relation to reported generic conspiracy theory beliefs in studies using the same measure. However, the sample age range began at 11 years; given that the current review has reported key stage 4 high school students (11–14 years) as having lower conspiracy theory beliefs, it would be expected that the overall score for the adolescent sample used by Goreis et al. would be lower than adult samples. In contrast, the level of COVID-19 conspiracy theory beliefs were similar for adults and adolescents. The authors hypothesize that younger participants may not have been exposed to as high a level of generic conspiracy theory beliefs compared with COVID-19 beliefs. It is possible that COVID-19 conspiracy theory exposure was greater than generic beliefs due to the novel nature of the global pandemic and the level of misinformation circulating in what can be considered the severest health crisis of current times. In the same study, stress was shown to have no relationship with conspiracy theory beliefs among the adolescent sample; the results conflict with those of Swami et al. (2016) who reported stressful life events and perceived stress to be significantly correlated with conspiracy theory beliefs among adults.

The result is surprising as perceived stress is a marker for mental illness among adolescents (Lindholdt et al., 2022) and the study used a sample of psychiatric patients.

When considering factors that affect the development of conspiracy theory beliefs, pathological factors at the subclinical level, such as schizotypy, paranoid thinking, and delusional thinking (Barron et al., 2014; Dagnall et al., 2015; Darwin et al., 2011), have been reported as significant predictors in adults, but the only measure in the studies included in the current review that has a relationship with schizotypal factors was paranoid thinking. While a small percentage of the population will present with clinical pathology, subclinical factors, such as delusional thinking and paranoia, are common among general population samples (Denecke et al., 2023; Heilskov et al., 2020). As paranoia is a component of schizotypy and delusional thinking, such factors have the potential to influence conspiracy theory beliefs in a large number of people. As such, the tendency for researchers to no longer give adequate attention to pathological explanations for belief in conspiracy theories may be unwarranted.

The relationship between paranoid thinking reported in the current review could be rooted in the effect of adverse life experiences. Goreis et al. (2023) reported adverse childhood experiences to be correlated with both generic and health conspiracy theory beliefs; early adverse experiences such as abuse and neglect have been reported as correlated with paranoia and psychosis-like events (Cristóbal-Narváez et al., 2016; Rodrigues et al., 2011), which could partially explain the reported correlation, although other studies have reported no effect for adverse experiences and delusions (Uptegrove et al., 2015). Mistrust at home was identified in the current review as an influencing factor in the endorsement of conspiracy theory beliefs. Mistrust is associated with paranoia (Martinez et al., 2021) and is reported as being higher among children than adolescents and adults (Zhou et al., 2018). As such, the development of mistrust before adolescence has the potential to be the first stage in the acquisition of conspiracy theory beliefs, calling into question whether conspiracy theory beliefs develop before the second decade of life. Likewise, perceived ostracism is correlated with paranoia (Waldeck et al., 2023) and belief in conspiracy theories in adults (Poon et al., 2020) but has not yet been explored in adolescent samples despite younger age groups presenting as more sensitive to ostracism than adults (Pharo et al., 2011).

Trait anxiety was reported as being correlated with conspiracy theory beliefs among male high school students (Grzesiak-Feldman, 2007). Studies examining the role of anxiety in relation to conspiracy theory beliefs have shown mixed results (De Coninck et al., 2021; Liekefett et al., 2023; Swami et al., 2016), but it should be noted that the study examined a specific conspiracy belief about Jews in a Polish sample. As a result, the findings could be specific to the cohort. The results showed a positive correlation for males with higher levels of trait anxiety but a negative correlation for females. A later adult study by Grzesiak-Feldman (2013) found anxiety positively correlated with conspiracy beliefs about Jews in an adult Polish sample. In contrast to the adolescent study, the later adult study showed both state and trait anxiety among males and females correlated with such beliefs. Given the results of the adolescent study, the positive correlation with anxiety for adult females is surprising; the adolescent study reported negative correlations between anxiety and conspiracy theory beliefs for the female participants. However, as reported by the author, low statistical power in the adult study may have confounded the results (Grzesiak-Feldman, 2013).

Of the factors identified in the current review, cognitive factors may have the most potential for developing intervention strategies. Rizeq (2019) reported open-minded thinking to be correlated with belief in conspiracy theories among a sample of 12–19 year old adolescents, reflecting the results reported by Swami et al. (2014) in an adult sample. Swami et al. also reported analytical thinking as a negative correlate of conspiracy theory beliefs, and the results of the adolescent study relating to open-minded thinking might be a consequence of its associations with critical and analytical thinking (Merma-Molina et al., 2022). Rizeq (2019) reported open-minded thinking and cognitive ability as negatively correlated with conspiracy theory beliefs, although cognitive reflection was not significant in the analyses. The negative relationship between actively open-minded thinking and conspiracy theory beliefs may lie in the reported relationships between both factors and schizotypal traits; lower actively open-minded thinking positively correlates with positive schizotypal traits, which in adult studies are reported to predict belief in conspiracies (Barron et al., 2014; Broyd et al., 2017). Ontological confusions also correlated with conspiracy theory beliefs; in a follow-up study that used an adult sample (18–30 years of age) completing the same measure, Rizeq (2019) reported no differences between adolescent and adult results in relation to conspiracy theory beliefs, or the relationship between ontological confusion and conspiracy theory beliefs. As ontological confusion is related to intuitive thinking, which in turn is represented through actively open-minded thinking (Svedholm & Lindeman, 2013), further exploration of the relationship between these factors is warranted.

## 4.2 | Limitations

The current review used an age range of 11–19 years. However, as most adult studies are inclusive of participants aged 18 years or above, there is a crossover between studies of adult and adolescent age groups. Two of the studies in the current review included participants aged 17–20 years, but both studies were from a country where small numbers of high school students are still in education at 20 years of age. However, it should be taken into consideration that even a small number of

20 year old participants may affect the results of the studies, if only marginally. Additionally, it should be noted that the review is limited by the definition of adolescence used, which denotes 19 years of age as the upper limit; while using the adolescent age range described in the methodology allows for a specific overview of teenage beliefs, it does not allow for exploration of lifespan changes in conspiracy theory beliefs.

The current review searched the PsyArXiv preprints database, but a broad gray search of the literature was not possible due to time constraints. It is possible that unpublished studies have been overlooked. Two articles were excluded due to not being published in the English language and it should be noted that it is not possible to ascertain the extent to which this limits the scope and conclusions of the review. It should also be taken into consideration that none of the included studies examined the same factors when examining relationships with belief in conspiracy theories. As there is no replication available for any of the included studies, it is not possible to draw firm conclusions from the results at present. Finally, the choice of categorization for the types of studies included in the review meant that one study, which used both COVID-19 and generic measures, was categorized under “COVID-19 conspiracy theories” only. The choice of categorization for the article was made due to the study in question focussing more on COVID-19 conspiracy theory beliefs and guideline adherence than generic conspiracy theory beliefs.

### 4.3 | Future directions

While it is possible that many of the relationships found in adult populations will be seen in adolescent samples, the mechanisms that drive the initial formation of belief in conspiracy theories in younger age groups may differ. If theoretical research is to move toward practical application, it is recommended that the relationships reported in adult studies of conspiracy theory beliefs are either confirmed among adolescents, or if differences exist between age groups, identified in adolescent samples. The formation and maintenance of conspiracy theory beliefs across the lifespan should be examined; changes in cognitive development may cause significant differences between teenagers, young adults, and older adults. Such changes may have specific implications for how different age groups within the general population collect, interpret, and respond to information relating to conspiracy theories. In particular, an exploration of subclinical pathology is required; delusional thinking, alongside schizotypal traits and paranoid thinking could provide, or contribute, to the initial acquisition of conspiracy theory beliefs. Additionally, such relationships require a move toward more experimental studies to better understand the causal basis of conspiracy theory belief. It is also recommended that, as education and intervention techniques are developed and tested, longitudinal designs are utilized to assess the longevity as well as the efficacy of conspiracy theory belief intervention and education strategies; although a reduction of belief in conspiracy theories is the goal of education and intervention programs, it might not be a practical strategy if the effects are only short-lived.

As discussed in the included study by Goreis et al. (2023), relationships between adverse childhood experiences and belief in conspiracy theories was reported in both an included adolescent study and one study using adult participants (Freeman & Bentall, 2017). As childhood trauma is common, particularly among psychiatric outpatients (Devi et al., 2019), future research would benefit from conducting longitudinal studies to assess differences in how conspiracy theory beliefs present and progress across time when present in those who experience childhood trauma. Likewise, the relationship between mistrust at home in adolescence and belief in conspiracy theories is of interest; adult studies have reported relationships between belief in conspiracy theories and mistrust (Jones et al., 2023; Simone et al., 2021). Mistrust in adolescence, particularly mistrust at home, might present in wholly different ways to general mistrust in others or institutional mistrust, and as such should be scrutinized more closely. One avenue of study related to mistrust that could be beneficial is that of ostracism; adults who feel ostracized are more likely to experience belief in conspiracy theories, a relationship shown to be mediated by vulnerability (Poon et al., 2020). Ostracism might also be related to the role played by peer problems and conduct, both of which were identified as factors associated with belief in conspiracy theories in the review. Likewise, and exploration of relationships between open-minded thinking, ontological confusions, schizotypy, and conspiracy theory beliefs could be fruitful.

If intervention and education is the goal of researchers, a number of factors identified in the review should be taken into consideration. Analytical thinking is negatively associated with belief in conspiracy theories, as is analytical priming, and further exploration of both factors in reducing adolescent conspiracy theory beliefs might prove fruitful. Similarly, critical thinking has potential as an education tool; as discussed in the introduction, a longitudinal study of epistemically unwarranted beliefs that specifically taught skills relating to pseudoscience had a small effect reported in relation to reducing belief in conspiracy theories, despite the education program not focussing on conspiracy beliefs (Dyer & Hall, 2019). Finally, it is important to establish whether the age of participants engaging in programs designed to reduce belief in conspiracy theories is important. Currently, it is not known whether delivering education before or during the emergence of belief in conspiracy theories would improve the potential efficacy of such programs, or if education would work at all when used in early adolescence. As a result, it is recommended that researchers engage in testing potential education programs across a wide range of ages and developmental stages.

## 5 | CONCLUSIONS

The current systematic review identified six studies examining adolescent belief in conspiracy theories. The studies assessed the role of sociodemographic factors, education, cognitive ability, personality traits, and mental health in relation to generic or specific conspiracy theory beliefs. The results suggest that conspiracy theory beliefs are already developing in the 11–14 year age group at key stage 4, are stable from 14 to 17 years, and continue into early adulthood. While the development of such beliefs appears to take place during the second decade of life, mistrust is seen to be higher in children than adolescents, and mistrust correlates with conspiracy theory belief in the latter population. As such, the results indicate that cognitive development in childhood could be influential in the initial formation of conspiracy theory beliefs, particularly for those experiencing early life adversity. Intervention could be the key to reducing conspiracy theory beliefs; open-minded thinking attenuates such beliefs in both adolescence and adulthood, as does cognitive ability. Future focus could be directed toward education-based programs to boost cognitive skills before the age where conspiracy theory beliefs begin to take hold. However, the current literature mostly overlooks a subsection of the population who are experiencing significant development of cognition, personality, and individual differences, and as such, focussing more on how and why such beliefs begin to form in early life could open new avenues of exploration.

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### CONFLICT OF INTEREST STATEMENT

The authors declare no conflict of interest.

### DATA AVAILABILITY STATEMENT

Details for how to access the data used for the included studies are available in Supporting Information: S2. Data sharing not applicable to this article as no data sets were generated or analyzed during the current study.

### ETHICS STATEMENT

This systematic review was approved by the University of Wolverhampton's Ethics Board.

### ORCID

Anthony Byrne  <http://orcid.org/0009-0007-5140-2930>

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## SUPPORTING INFORMATION

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