Title: Conspiracist Beliefs, Intuitive Thinking and Schizotypal Facets: A Further Evaluation

Running head: Conspiracist Beliefs, Intuitive Thinking and Schizotypy

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Abstract

This study examined whether thinking style mediated relationships between belief in conspiracy and schizotypy facets. A UK-based sample of 421 respondents completed the Generic Conspiracist Beliefs Scale (GCBS), Oxford-Liverpool Inventory of Feelings and Experiences Short (O-Life), and measures indexing preferential thinking style (proneness to reality testing deficits and Need for Cognition). Path analysis revealed direct and indirect relationships between Conspiracy Beliefs and schizotypy facets. Unusual Experiences had a direct effect on Conspiracy Beliefs and predicted Reality Testing and Need for Cognition. Preferential thinking style mediated the schizotypy-belief in conspiracy relationship. This pattern of results (higher experiential-based processing and lower Need for Cognition) was consistent with intuitive thinking. Introverted Anhedonia and Impulsive Nonconformity predicted Reality Testing and had indirect effects on Conspiracy Beliefs. Finally, Reality Testing predicted Conspiracy Beliefs, whereas Need for Cognition did not. These results confirm that cognitive processes related to thinking style mediate the schizotypy-conspiracist beliefs relationship.

Keywords: conspiracy beliefs; intuitive thinking; analytical thinking; schizotypy; thinking style

1. Introduction

Recent opinion polls report that belief in conspiracy theories is relatively common within modern societies. Notable examples are surveys from YouGov (Which Science-Based Conspiracy Theories Do Britons Believe?, 2019) and the Pew Centre (Americans' Knowledge and Perception of Coronavirus, 2020). These align with earlier research. For instance, Oliver and Wood (2014) found that half of the American public endorsed at least one conspiracy. Similarly, Swami, Chamorro-Premuzic, and Furnham (2010) reported that 36% of American respondents thought it was at least somewhat likely that their government assisted or took no action to prevent the 9/11 attacks. These results accord with the observation that a substantial number of people believe that the British government covered up its role in the 7/7 bombings (Soni, 2007). Moreover, individuals who endorse a single conspiracy theory are more likely to believe in multiple theories; indeed, the best predictor of belief in a conspiracy theory is acceptance of another conspiracy theory (e.g., Goertzel, 1994). Although due to cultural and contextual factors, illustrations such as these provide only a crude index of general level of belief in conspiracy theories. Collectively they indicate that a substantial number of people trust and legitimise conspiratorial narratives.

Notwithstanding prevalence, research into belief in conspiracies is important because conspiracies influence perceptions of important modern (e.g., global warming, Douglas & Sutton, 2015) and historical (e.g., assassination of President John F. Kennedy, Butler, Koopman, & Zimbardo, 1995) events. This can result in both positive and negative consequences (Douglas & Jolley, 2014). Favourable outcomes associated with exposure to non-mainstream explanations include (i) the identification of irregularities in official explanations (e.g., Clarke, 2002), (ii) encouragement of government transparency (e.g., Fenster, 1999), and (iii) stimulation of political debate (Miller, 2002). Adverse consequences embrace reduced participation with and faith in social institutions (e.g., democratic,

governmental, human rights, and security systems) (Swami, Nader, Pietschnig, Stieger, Tran, & Voracek, 2012).

Given these important effects and the prevalence of belief in conspiracy theories, it is important from a psychological perspective to examine the foundation, allure and function(s) served by belief in conspiracy theories. To achieve this, it is necessary to consider theoretical conceptualizations of conspiracy theories. Whilst there is no single agreed definition, it is important to note that academic delineations share major themes (Grimes, 2016). These emphasize secrecy, subterfuge, and manipulation, which manifest as the conviction that powerful groups or collectives clandestinely plan and implement strategies with the intention of achieving malevolent goals (Bale, 2007; Sunstein & Vermeule 2009). A principal feature of a conspiracy theory being the conviction that actions are premeditated and deliberate (Jolley & Douglas, 2014). Some authors view this in the context of the Manichean struggle between good and evil (Oliver & Wood, 2014).

Another chief characteristic of conspiracy theory is that advocates habitually cite scientific proof to support uncorroborated claims (Soukup, 2008). Though evidence typically lacks appropriateness and/or objective substantiation, the mere reference to ‘apparent’ empirical evidence superficially provides an illusion of validity and increases account credibility. This in part explains why conspiracy theories often present as authentic alternatives to official explanations. This is especially true when authorised explanations appear evidentially deficient, and/or intuitively implausible (Drinkwater, Dagnall, & Parker, 2012).

The durability and widespread expression of conspiracy theories suggests that they perform important psychological functions. One particular purpose is to provide explanations for significant social and political events. Another is to afford an outlet for political cynicism. In extreme forms, this can prove dysfunctional at both an individual and societal level (Douglas, Sutton, Jolley, & Wood, 2015).

1.1. Cognitive-perceptual basis of belief in conspiracy theories

Identification of adverse consequences has encouraged interest in the psychological origins of conspiratorial ideation across a range of perspectives (e.g., clinical, cognitive, personality, and social). Over the past decade, this has stimulated considerable attention on determining the psychological factors that best predict belief in conspiracy theories (Wood, 2017). A recent meta-analysis by Goreis and Voracek (2019) outlines the step increase in conspiracy focused psychology publications between 2008 to March 2018.

This work generally has sought to understand the factors that influence, promote and maintain conspiratorial beliefs. A particularly fertile research strand has focused on the role of cognitive-perceptual factors and thinking style (Barron et al., 2018; Dagnall, Drinkwater, Parker, Denovan, & Parton, 2015b; Drinkwater et al., 2012; Irwin, Dagnall, & Drinkwater, 2015). In this context, the construct of schizotypy has received significant attention (e.g., Barron, Morgan, Towell, Altemeyer, & Swami, 2014; Swami, Weis, Lay, Barron, & Furnham, 2016).

Though theorists propose alternative models of schizophrenia/psychosis-proneness (see Grant, Green, & Mason, 2018), most studies examining conspiratorial ideation in non-clinical populations have focused on dimensional approaches (Eysenck, 1947/1952). These conceptualise psychotic illness as the extreme end of a continuous personality dimension. Eysenck (1947/1952) views this as a full continuum, whereas Claridge (1985/1997) posits a boundary between health and illness (i.e., schizotypy-schizophrenia) that demarcates disorder. From the perspective of dimensional approaches, schizotypy is a latent personality organisation that reflects liability to develop schizophrenia-spectrum disorders (Kwapil & Barrantes-Vidal, 2015).

Dimensional approaches are important because they acknowledge that schizotypal traits influence cognitive-perceptual processing within the general population, and in doing so

contribute to the formation/maintenance of unorthodox beliefs (e.g., paranormal forces). Hence, the dimensional model acts as a coherent conceptual framework for investigating conspiratorial ideation in the general population (Barron et al., 2018).

Consistent with this notion, studies robustly report a moderate significant positive association between schizotypy and conspiratorial beliefs (Bruder, Haffke, Neave, Nouripanah, & Imhoff, 2013; Darwin, Neave, & Holmes, 2011; van der Tempel & Alcock, 2015). This finding indicates that though distinct, the constructs share important psychological features (Wood, 2017). Correspondingly, schizotypy and conspiratorial beliefs are moderately associated with theoretically related variables, such as delusional ideation (Dagnall, Denovan, Drinkwater, Parker, & Clough, 2016a), paranormal belief, and proneness to reality testing deficits (Drinkwater et al., 2012). This is especially true at the factorial level of cognitive-perceptual characteristics related to positive facets of schizotypy (i.e., Odd or Magical Thinking and Ideas of Reference) (Barron et al., 2014; Dagnall et al., 2015b). These lower order facets share key characteristics with conspiratorial thinking. Particularly, suspiciousness of mainstream sources of information, and the tendency to dismiss official material (Barron et al., 2014; Dagnall et al., 2015b; Swami et al., 2016).

Recent research has extended this work by acknowledging that relationships between conspiratorial beliefs and schizotypal facets are more complex than simple correlation-based analyses indicate (Barron et al., 2018). Hence, alongside direct effects, investigators are also increasingly considering the importance of indirect effects arising from mediating cognitive processes (Bogart, Wagner, Galvan, & Banks, 2010; Kata, 2010). Pertinent to the present study, Barron et al. (2018) found that analytic thinking mediated the relationship between belief in conspiracies and Odd Beliefs or Magical Thinking (but not Ideas of Reference). Barron et al. (2018) postulated that this occurred because the cognitive disorganisation and possible delusional ideation that is associated with high scores on Odd Beliefs and Magical Thinking

(Dagnall et al., 2015b), lowers propensity to process information analytically (i.e., encourages dismissal of official sources of information, Swami et al., 2011) resulting in increased susceptibility to belief in conspiracies.

Barron et al. (2018) found also that higher scores on Odd Beliefs or Magical Thinking and Ideas of Reference were positively associated with greater self-certainty. Self-certainty refers to unwillingness to acknowledge the possibility that one may be wrong about an issue, and greater assertiveness in one's own judgments (Barron et al., 2018; Beck, Baruch, Balter, Steer, & Warman, 2004). Furthermore, higher self-certainty correlated with increased levels of conspiracist beliefs. Thus, consideration of indirect mediating factors provided a sophisticated, nuanced understanding of the relationship between conspiratorial ideation and schizotypy (Dagnall et al., 2015b; Darwin et al., 2011).

A limitation of the Barron et al. (2018) study was that it considered only the lower order schizotypy facets with the strongest associations (i.e., Odd Beliefs or Magical Thinking and Ideas of Reference). This decision derived from the supposition that positive facets of schizotypy (i.e., those associated with cognitive-perceptual elements) facilitate greater belief in conspiracies (Barron et al., 2014). Even though preceding work informed this conclusion, there remains the possibility that cognitive processes also mediate other lower order schizotypy facets, and influence belief in conspiracy theories. A further limitation of Barron et al. (2018) is that they did not consider the influence of additional thinking styles, such as intuitive-experiential thinking. Consideration of this is important given the established links with conspiracy beliefs (e.g., Drinkwater et al., 2012; Irwin, 2009). Looking at the nature of conspiratorial thinking, which draws largely on personal experience and subjective worldview, and the attributes of intuitive thinking, this thinking style is likely to more strongly predict conspiracy beliefs (as opposed to rational-analytical thinking).

1.2. The Present Paper

Building on this approach, the present paper examined how mediation between the full range of schizotypy subscales and cognitive processes influenced belief in conspiracy theories. To facilitate direct comparisons with subsequent work, cognitive processes related to thinking style were included. The presence of two unipolar dimensions corresponding to intuitive-experiential (i.e., proneness to reality testing deficits) and rational-analytical processing (i.e., need for cognition) was consistent with dual-process theorists, who propose that these distinct processing systems drive reasoning (Epstein, Pacini, Denes-Raj, & Heier, 1996).

The terminology used to define these processes varies across dual-process models (see Shirzadifard, Shahghasemi, Hejazi, Naghsh & Ranjbar, 2018). Prominent examples are heuristic and systematic (Chaiken, 1980; Petty & Cacioppo, 1981), implicit and explicit (Reber, 1993), system 1 and system 2 (Stanovich, 1999), and experiential and rational (Epstein, 1983). Although, there are differences between these classifications, scholars agree on major features of the processing styles.

A commonly cited dual-processing model is Cognitive-Experiential Self-Theory (Epstein, 1990). This proposes that rational and experiential thinking systems influence decision-making processes. Although these systems operate in parallel and jointly contribute to reasoning, one system often predominates giving rise to a preferential thinking style or mode. The experiential system is characterised as being fast, automatic, holistic, and unconscious and operates on beliefs derived from feelings and emotional experiences (Epstein et al., 1996). Whereas, the rational system is effortful, deliberate, and conscious (Epstein, 1994). Hence, rational thinking is slow and analytical.

Concerning intuitive-based thinking, the present paper used the reality testing subscale of the Inventory of Personality Organization (IPO-RT; Lenzenweger, Clarkin, Kernberg, & Foelsch, 2001) rather than the faith in intuition (FI) subscale of the Rational Experiential

Inventory (REI; Pacini & Epstein, 1999). Both instruments are accepted indices of intuitive thinking. The reason for using the IPO-RT was that the scale derives from an information-processing approach to belief generation and focuses on the ability to differentiate self from non-self, intrapsychic from external stimuli, and the capacity to maintain empathy with ordinary social criteria of reality (Kernberg, 1996). Key to this perspective is the proposition that pathological beliefs or delusions arise in part from the failure to subject hypothetical explanations of sensory experience to critical thinking (see Langdon & Coltheart, 2000).

Additionally, the scale indexes a breadth of construct content including perceptual, cognitive, social, and emotional elements of internal/self-orientation (Dagnall, Denovan, Parker, Drinkwater, & Walsh, 2018). Although, the IPO-RT is a proxy rather than direct measure of intuitive-experiential thinking several published papers have used the scale to assess preference for subjective (vs. objective) experience (e.g., Dagnall, Drinkwater, Denovan, & Parker, 2015a;Dagnall, Drinkwater, Parker, & Rowley, 2014; Dagnall, Irwin, & Drinkwater, 2017; Denovan, Dagnall, Drinkwater, Parker, & Clough, 2017; Drinkwater et al., 2012; Irwin, 2003/2004). In contrast to the IPO-RT, FI evaluates a narrow range of domain content, explicitly the extent to which individuals trust their intuitions and instincts (Pennycook, Cheyne, Koehler, & Fugelsang, 2016).

This study used a brief measure of Need for Cognition scale (Cacioppo & Petty, 1982; Cacioppo, Petty, Feinstein, & Jarvis, 1996) to assess rational-analytical processing. Need for Cognition assesses the extent to which a person engages in and enjoys effortful thinking. Although, FI and Need for Cognition intuitively represent polar opposites of a single dimension, they represent separate factors (Pennycook et al., 2016). Noting this they represent distinct subscales within the REI, which researchers have used to differentially capture a range of psychological measures (Cacioppo & Petty, 1982; Pacini & Epstein, 1999).

Based on the work of Barron et al. (2018), this study anticipated direct and indirect predictive relationships (using path analyses) between lower order schizotypy facets and belief in conspiracy, with the strongest effects existing for Unusual Experiences. Furthermore, it was anticipated that intuitive-experiential thinking (rather than analytical-rational) would have a greater mediating effect on belief in conspiracy.

2. Methods

2.1. Participants

Precise sample calculations are not typically performed for path analyses. However, Kline (2011) recommends a minimum of 10 participants per estimated parameter. Model simulation revealed 34 parameters existed, thus requiring upwards of 340 participants. Accordingly, a sufficiently large sample of 421 (age ranged from 18 to 82; M = 52.44, SD = 14.60) was recruited by a market research company (i.e., Critical Mix). The researchers instructed the company to enlist respondents who were UK-based and non-vulnerable adults (i.e., aged 18 years and older). The sample comprised 201 women (age range 18 to 78 years; M = 48.62, SD = 14.25) and 220 men (age range 22 to 83 years; M = 55.91, SD = 14.08).

2.2. Measures

2.2.1. Conspiracist beliefs

The Generic Conspiracist Beliefs Scale (GCBS, Brotherton, French, & Pickering, 2013) is the mostly commonly used measure of belief in conspiracies (Goreis & Voracek, 2019). The scale focuses on abstract, overarching thematic concepts without reference to specific theories. Although items index five factors (Government Malfeasance, Malevolent Global Conspiracies, Extraterrestrial Cover-up, Personal Wellbeing, and Control of Information), the scale is typically used as a global measure. The GCBS presents items as statements (e.g., "*The government permits or perpetrates acts of terrorism on its own soil, disguising its involvement*") and respondents indicate their level of agreement on a 7-point Likert scale (i.e.,

1 = *Definitely not true*, 7 = *Definitely true*). Higher scores indicate greater belief in conspiracies. The GCBS possesses good psychometric properties (Brotherton et al., 2013). Specifically, validity and reliability. In this study, alpha reliability was high (α = .95).

2.2.2. Schizotypy

To examine schizotypal personality traits in non-clinical individuals the present study used the Oxford-Liverpool Inventory of Feelings and Experiences Short (O-LIFE; Mason, Linney, & Claridge, 2005). While the O-LIFE Short was originally a screening tool, its brevity has led to wider adoption. The O-LIFE Short consists of 43-items indexing four sub-scales. Unusual Experiences (12-items) assesses positive symptoms of psychosis (perceptual aberrations, magical thinking, and hallucinations). Cognitive Disorganisation (11-items) taps disorganised aspects of psychosis, such as thought disorder (i.e., poor attention/concentration, poor decision-making, and social anxiety). Introverted Anhedonia (10-items) measures negative schizotypy (schizoid temperament). Explicitly, lack of enjoyment from social and physical sources of pleasure and avoidance of intimacy. Impulsive Nonconformity (10-items) references lack of self-control (i.e., impulsive, anti-social, and eccentric behaviour). Items appear as questions (e.g., "*Are you easily confused if too much happens at the same time*?") and respondents indicate, via a dichotomous scale, the presence (*YES*) or absence (*NO*) of the symptom. Summation of scale items produces an overall score. The O-LIFE Short is psychometrically sound (Burch, Steel, & Hemsley, 1998). In this study, consistent with previous research (Mason et al., 2005), Unusual Experiences (α = .86) and Cognitive Disorganisation (α = .87) demonstrated high internal reliability. Introverted Anhedonia (α = .60) and Impulsive Nonconformity (α = .66) possessed adequate internal reliability (Lance, Butts & Michels, 2006) and similar results to Mason et al. (2005).

2.2.3. Reality testing

The Reality Testing subscale of the Inventory of Personality Organization (IPO-RT; Lenzenweger et al., 2001) measures the ability to differentiate self from non-self, intrapsychic from external stimuli, and the capacity to maintain empathy with ordinary social criteria of reality (Kernberg, 1996). This perspective derives from an information-processing approach to belief generation (Langdon & Coltheart, 2000). Consequently, researchers use the IPO-RT to assess proneness to reality testing deficits (Dagnall, Denovan, Drinkwater, Parker, & Clough, 2017a). Particularly, as an index of the tendency to engage in subjective-intuitive thinking (Denovan et al., 2017). The IPO-RT comprises 20-items that appear as statements (e.g., "*I believe that things will happen simply by thinking about them*"). Respondents specify their level of agreement on a five-point Likert scale. Responses range from 1 = *Never true*, 5 = *Always true*. Summation of item totals produces scores between 20 and 100. Higher scores indicate propensity to reality testing deficits. Previous research has established that the IPO-RT is psychometrically robust (Dagnall et el., 2018). In the current study, high internal consistency existed for the IPO-RT (α = .95).

2.2.4. Need for cognition

The REI-10 is an abridged version of The Rational Experiential Inventory (REI; Epstein et al., 1996). REI measures assess information-processing preference and thinking style from the conceptual perspective of Cognitive-Experiential Self-Theory (CEST; Epstein, 1993). Accordingly, the REI-10 comprises subscales measuring Need for Cognition (Cacioppo & Petty, 1982) and Faith in Intuition. The present study used only Need for Cognition (five-items), which indexes inclination to rational thinking (e.g., "*I prefer complex to simple problems*"). Explicitly, the propensity to seek intellectual challenging experiences. Respondents indicate the degree to which they believe each item reflects their thinking style using a 5-point Likert scale (1 = *Completely false*, 5 = *Completely true*). Higher scores indicate

greater preference for rational thinking. The Need for Cognition subscale has established psychometric properties and demonstrated satisfactory reliability in this study (α = .72).

2.3. Procedures

This study received ethical approval from the Faculty of Health and Life Sciences, Research Ethics Committee at the University of Northumbria. Critical Mix, a company who provide easy access to global survey respondents, collected data for the researchers. Generally, samples recruited via participation pools and recruitment panels are more demographically diverse than traditional university-based online samples (Buhrmester, Kwang, & Gosling, 2011).

The researchers uploaded the measures to Qualtrics, a web-based survey-hosting platform. Prior to participating, respondents read the study brief and provided informed consent. Except for the demographics section (i.e., age, preferred gender, and country of birth), which always appeared first, measure order was counter-balanced across respondents. All participants received a written debrief at the end of the study.

The present study used a cross-sectional design. An issue with cross-sectional design is the potential for common method variance (CMV) (Spector, 2019). Noting this, the researchers used procedural remedies (Krishnaveni & Deepa, 2013). Explicitly, detailed instructions created methodological distance between study variables. These reduced the possibility of CMV by emphasizing that scales were independent and assessed different constructs. Furthermore, measures employed different response scales. Previous research reports that these techniques create psychological separation between constructs and reduce CMV (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003). Finally, the study brief reduced the potential for social desirability effects and evaluation apprehension by emphasising the need to answer questions as honestly as possible and stating that there were no right or wrong answers.

3. Results

3.1. Descriptive statistics

Table 1 displays descriptive statistics and zero-order correlations. Data screening for univariate normality revealed that skewness and kurtosis statistics were within the recommended range of -2.0 to +2.0 (Byrne, 2016). A test of multivariate normality (Mardia's test; Mardia, 1970) found no concerns. Mardia's coefficient (0.80, critical ratio = 0.73) was lower than the cutoff of 3. Weak to strong positive correlations were present between O-Life total and its subscales (Unusual Experiences, Cognitive Disorganisation, Introverted Anhedonia and Impulsive Nonconformity). IPO-RT (Reality Testing) had moderate to strong associations with O-Life total and all subscales, but Introverted Anhedonia (weak correlation). Need for Cognition correlated weakly with all study variables. Excluding this, there were weak to moderate associations between GCBS (Conspiracy Beliefs) and the study variables.

Table 1 here

3.2. Path analyses

Assessment of the hypothesised mediation model (Figure 1) utilised AMOS25. Absolute and comparative fit indices assessed data-model fit. Absolute fit indices included the Root-Mean-Square Error of Approximation (RMSEA) and the Standardised Root-Mean-Square Residual (SRMR). RMSEA reflects the size of the residuals when using the model to predict data, and uses a 90% confidence interval (CI). SRMR examines the mean absolute correlation residual. For both indices, smaller values indicate better model fit. The Comparative Fit Index (CFI) examines the discrepancy between observed data and the hypothesized model, while adjusting for sample size. Larger values suggest greater fit (and thereby less discrepancy). According to Browne and Cudeck (1993), an acceptable model requires RMSEA

< 0.10, SRMR < 0.08, and CFI > 0.90. Model comparison included consultation of Akaike's Information Criterion (AIC), with lower values representing superior fit.

Figure 1 here

Analysis found acceptable fit on all indices, but RMSEA, χ^2 (1, N = 421) = 29.83, p < 0.001, CFI = 0.97, RMSEA = 0.26 (90% CI of 0.19 to 0.35), SRMR = 0.04. Scrutiny of modification indices inferred that covarying terms between Need for Cognition and Reality Testing improved model fit (a method utilised by Barron et al., 2018). Examining path estimates revealed the presence of non-significant paths, specifically between Cognitive Disorganisation and Reality Testing (-0.01), Introverted Anhedonia and Need for Cognition (-0.05), Impulsive Nonconformity and Need for Cognition (-0.11), and Need for Cognition and Conspiracy Beliefs (0.06). Therefore, analysis considered a model with non-significant paths fixed to zero and correlated error between Need for Cognition and Reality Testing. This model (Figure 2) demonstrated acceptable fit on all indices, χ^2 (4, N = 421) = 6.25, p = 0.181, CFI = 0.99, RMSEA = 0.03 (90% CI of 0.01 to 0.08), SRMR = 0.01. In addition, a lower AIC existed compared with the initial solution (68.25 vs. 97.83).

Figure 2 here

Analysis computed direct, indirect, and total effects of schizotypy subscales on Conspiracy Beliefs through the significant path of Reality Testing to Conspiracy Beliefs, drawing on 5000 bias-corrected bootstrap resamples. Reality Testing had a significant standardised direct effect on Conspiracy Beliefs (Table 2). In addition, significant standardised total effects existed for the following pathways: Impulsive Nonconformity > Reality Testing >

Conspiracy Beliefs, and Unusual Experiences > Reality Testing > Conspiracy Beliefs. Impulsive Nonconformity and Unusual Experiences had a significant indirect (mediated) effect on Conspiracy Beliefs via Reality Testing. The non-significant direct effects of Impulsive Nonconformity (0.01, $p = 0.986$) and Unusual Experiences (0.10, $p = 0.098$) on Conspiracy Beliefs further supported mediation.

Table 2 here

4. Discussion

Conspiracy Beliefs correlated positively with overall level of schizotypy. The observed moderate relationship was similar to previous findings (e.g., Barron et al., 2014; Bruder et al., 2013; Dagnall et al., 2015b; Darwin et al., 2011; van der Tempel & Alcock, 2015). This outcome concurred with the observation that the association is robust; stable across different samples and alternative measurement instruments (Barron et al., 2018). In the case of belief in conspiracy, this is important to note because the construct is assessed by myriad measures, which derive from differing conceptual perspectives (i.e., specific theories vs. generic beliefs), and comprise divergent content (i.e., theories included) (see Dagnall et al., 2015b).

Despite the presence of a significant body of related research, relatively few preceding studies have examined variations in conspiratorial belief as a function of schizotypy subscales (Barron et al., 2014). Furthermore, those that have, focus mainly on positive schizotypy (i.e., Unusual Experiences, O-LIFE, Mason et al. 2005; Cognitive-Perceptual, SPQ-B, Raine & Benishay, 1995) (Barron et al., 2018; Dagnall et al, 2015). Acknowledging this, the current article considered the full range of schizotypy facets. The major advantage of this approach is that it facilitates identification of intricate predictive relationships typically obscured when using full-scale scores. Thus, analysis of subfactors is important because it provides novel

theoretical insights. For example, employing this strategy in a paper examining associations between belief in conspiracy theories and maladaptive personality traits, Swami et al. (2016) were able to identify the predictive importance of Unusual Beliefs and Experiences, and Suspiciousness.

Within the current paper, path analysis revealed direct and indirect positive relationships between belief in conspiracy theories and the lower-order facets of schizotypy (Unusual Experiences, Cognitive Disorganisation, Introverted Anhedonia, and Impulsive Nonconformity). As posited, Unusual Experiences predicted proneness to reality testing deficits (Reality Testing) and Need for Cognition. This pattern of results (higher levels of intrapsychic, experiential-based processing, and lower levels of Need for Cognition) was characteristic of intuitive-experiential thinking. Unusual Experiences also had an indirect effect on Conspiracy Beliefs, predicting increased level of conspiratorial belief. Introverted Anhedonia and Impulsive Nonconformity predicted Reality Testing only and had indirect effects on Conspiracy Beliefs (though the total effect of Introverted Anhedonia was non-significant). Cognitive Disorganisation did not have an indirect effect on conspiracy and predicted Need for Cognition only. Finally, Reality Testing significantly predicted Conspiracy Beliefs, whereas Need for Cognition did not. The observation of complex predictive relationships justified examination of schizotypy subfactors. Accordingly, the researchers advocate this approach in ensuing conspiracy-based research using multidimensional predictors (Barron et al., 2014/2018; Dagnall et al., 2015b).

Cognitive Disorganisation and Impulsive Nonconformity correlated positively with Reality Testing and lower Need for Cognition. This suggested that schizotypy dimensions generally incline individuals towards intuitive, experiential-based processing, and away from effortful cognitive activities, such as evaluation. Indeed, prior research has found that both belief in conspiracy theories and the paranormal correlate with intuitive thinking, as indexed

by the Inventory of Personality Organization-Reality Testing subscale (IPO-RT) (Drinkwater et al., 2012). Ensuing work extended this finding by demonstrating that thinking style predisposition promotes endorsement of conspiracy theories (Barron et al., 2018). Furthermore, facilitation of analytical thinking (Swami et al., 2014), and presentation of rational and ridiculing arguments (Orosz et al., 2016) have successfully reduced belief in conspiracy theories. The assumption that the schizotypy subfactors are associated with impaired performance on logical reasoning problems concurs with Tsakanikos (2004).

The observation that higher positive (Unusual Experiences) and negative (Introverted Anhedonia) schizotypy were associated with greater Reality Testing and lower Need for Cognition scores aligned with Broyd, Ettinger, and Thoma (2019), who proposed that this pattern of results was concomitant with increased Type 1 (intuitive) processing. Other researchers have also found that higher levels of schizotypy were attendant with increased intuitive thinking (e.g., Boden, Berenbaum & Topper, 2012). Intuitive thinking by its inherent nature (rapid, unconscious, experiential, and heuristic driven) can undermine critical thinking (Dagnall et al., 2016a), and weaken performance on reasoning tasks, especially when levels of belief are high (Denovan, Dagnall, Drinkwater, & Parker, 2018). Illustratively, belief in conspiracy theories is associated with conjunction fallacy (Dagnall, Denovan, Drinkwater, Parker, & Clough, 2017b), and impaired judgment of perception of randomness predicts belief in the paranormal (Dagnall, Drinkwater, Denovan, Parker, & Rowley, 2016b; Dagnall, Parker, & Munley, 2007).

Given the pattern of results observed in the current study, intuitive thinking, as indirectly indexed by Reality Testing, mediated schizotypy subscales, not Need for Cognition. The finding that Need for Cognition was not predictive of belief in conspiracy theories corresponded with previous papers (i.e., Abalakina-Paap, Stephan, Craig, & Gregory, 1999; Swami et al., 2014). Historically, the assumption of a potential relationship derived from the

supposition that conspiracy theories provide simplified explanations of complex real-world events (Abalakina-Paap et al., 1999). However, inspection of prevailing conspiratorial narratives indicates that this is typically not the case.

Conspiracy theories are inherently elaborate because they provide a basis for dismissing predominant elucidations, and present evidence that supports their alternative explanation. Thus, there is no real justification to support the assertion that belief in conspiracies is less cognitively demanding than acceptance of official accounts. In fact, theorists have noted that the articulate nature of major conspiracy theories indicates that they draw upon higher-order cognitive processes (van Prooijen & Van Vugt, 2018). On this basis, it is appropriate to conclude that the cognitive demands of endorsing a typical conspiracy theory are commensurate with general heuristic-based thinking and decision making in situations of uncertainty.

Moreover, the concept of need for cognition denotes dispositional differences in cognitive motivation, and reflects an intrinsic desire to engage in, and enjoy effortful mental endeavours (Cacioppo & Petty, 1982, Cacioppo, Petty, Feinstein, & Jarvis, 1996). These features do not directly index reasoning ability. Recent academic work supports the supposition that Need for Cognition indirectly indexes cognitive abilities, which indirectly influence decision-making processes. For example, He et al. (2019) observed that brain networks associated with Need for Cognition were also involved with higher-order cognitive functions (i.e., executive control, salience detection, spontaneous thought, and motivation function). Collectively, this evidence indicates that the supposition that Need for Cognition indexes rational thought and in turn, belief in conspiracies is grossly oversimplified.

In the context of conspiracy theories, the role and function of rationality is more difficult to assess. Though conspiratorial ideation is associated with restricted reasoning (e.g., truncated logic, jumping to conclusions, and limited appraisal of available logic) and assumed

irrationality, it is internally coherent and more consistent with bounded rationality; that is logical within the confines of the self. Considering these factors, this paper's findings aligned with the notion that belief in conspiracy theories arises from the reification of intra-psychic data. From this perspective, an overreliance on a personal worldview predicts belief in conspiracy theories (Dagnall et al., 2015b). Thus, conspiracy theories represent broad, internally consistent explanations that enable preservation of beliefs in the face of uncertainty and contradiction (Douglas, Sutton, & Cichocka, 2017).

In order to test these suppositions subsequent research should examine relationships between thinking style and belief in conspiracy theories further. One possibility is to use cluster analysis to determine whether rational and intuitive thinking in combination influence belief in conspiracies. This approach has previously produced informative outcomes. For example, Wolfradt, Oubaid, Straube, Bischoff, and Mischo (1999), using cluster analysis revealed four thinking styles: rational (high rational and low intuitive), intuitive (high intuitive and low rational), complementary (high rational and high intuitive), and poor (low rational and low intuitive). Of these clusters, complementary produced higher scores on anomalous experiences, the cognitive–perceptual aspects of schizotypy, and self-efficacy. This approach has also identified subtle differences in reasoning problems as a function of level of schizotypy and paranormal belief (Denovan et al., 2018). Performing similar analysis on belief in conspiracy theory would provide additional useful insights into how thinking style effects belief in conspiracy theories.

Overall, the findings of the present paper indicate that intuitive thinking provides a framework for interpreting cognitions related to subfactors of schizotypy (Unusual Experiences, Introverted Anhedonia, and Impulsive Nonconformity), especially positive schizotypy (Williams & Irwin, 1991), and this in turn influences endorsement of belief in conspiracy theories. Although, these conclusions derive from previous work, and were

consistent with contemporary theorising there are nonetheless limitations to consider. One concern was the selection of Reality Testing as an indirect index of intuitive thinking style. Although, researchers have often used the scale in this capacity, the IPO-RT assesses and focuses on the ability to differentiate self from non-self, intrapsychic from external stimuli, and the capacity to maintain empathy with ordinary social criteria of reality (Kernberg, 1996). To address this concern subsequent work could use several indices of intuitive thinking. This would establish convergent validity and ensure that the findings were not merely an artefact of the IPO-RT.

In addition to intuitive thinking, researchers have used a range of scales to assess belief in conspiracy theories (see Swami et al., 2017), schizotypy (e.g., Schizotypal Personality Questionnaire, SPQ; Raine, 1991; The O-LIFE brief (Mason et al., 2005), and need for cognition (REI, Epstein et al., 1996; Need for Closure Scale, Roets & van Hiel, 2011). This variation makes inter-study comparisons difficult. It may also explain why some papers, such as Barron et al. (2018), report that analytical thinking (rather than intuitive processing) mediate the associations between belief in conspiracy theories and schizotypy. Hence, subsequent work should review the extant literature with a view to establishing commonality and greater standardisation. A more systems-based approach to the relationships between belief in conspiracy, schizotypy, and thinking style may prove more conceptually insightful.

A further potential limitation is the positioning of variables within the model. At a superficial level, there are conceptual similarities between the content of schizotypy and proneness to reality testing deficits. Particularly, both constructs are concerned with cognitive-perceptual experiences. Despite this, the two factors are conceptually and quantitatively different. Schizotypy denotes a personality type or trait (Mason, 2014), or latent personality organization (Lenzenweger, 2018) that produces schizophrenia-like features in the absence of illness, whereas proneness to reality testing deficits represents an information-processing

approach to belief generation (Kernberg, 1996). This rationale justifies the use of Reality Testing as a mediating variable. From this perspective, high schizotypy generates mental activity, and reality testing gives it meaning. The fact that the two factors share only 33% variance demonstrates that they are related, but independent constructs.

Finally, although the present results were consistent with previous research, the use of a cross-sectional design prevented the establishment of causal relationships. Recognising this, future work could assess differences across multiple time points alongside observation of change/development in the variables via use of a longitudinal design. This would enable researchers to establish the temporal stability of the relationships, make more causal inferences, and examine if effects replicate (Spector, 2019).

Despite these limitations, this study makes an important contribution to academic understanding of belief in conspiracy theories. Explicitly, by considering the full range of schizotypy subscales and examining the mediating effects of thinking style on the schizotypy-conspiracy relationship, this paper provides nuanced conceptual insights into the cognitive-perceptual factors associated (directly and indirectly) with conspiratorial ideation.

Data availability statement

Data is accessible through figshare: https://dx.doi.org/10.6084/m9.figshare.11877789

Compliance with ethical standards

The Faculty of Health, Psychology and Social Care Ethics Committee at Manchester Metropolitan University approved this study. All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Individual participants provided informed consent.

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Table 1 Means, standard deviations and correlations for all study variables (N = 421)

Variable	*M*	*SD*	Skew	Kurt.	1	2	3	4	5	6	7	8
1. O-Life Total	13.89	8.72	0.61	-0.50		0.84**	0.87**	0.57**	0.77**	0.57**	-0.20**	0.39**
2. Unusual Experiences	3.23	3.26	0.91	-0.06			0.64**	0.24**	0.62**	0.55**	-0.07	0.38**
3. Cognitive Disorganisation	4.03	3.44	0.49	-0.98				0.39**	0.54**	0.41**	-0.24**	0.30**
4. Introverted Anhedonia	3.94	2.23	0.16	-0.66					0.31**	0.26**	-0.15*	0.17**
5. Impulsive Nonconformity	2.67	2.15	0.64	-0.38						0.55**	-0.16*	0.34**
6. Reality Testing	41.76	15.90	0.72	0.40							-0.28**	0.51**
7. Need for Cognition	17.33	3.64	-0.16	0.22								-0.10*
8. Conspiracy Beliefs	39.36	13.85	0.15	-0.67								

Note. * $p < 0.05$; ** $p < 0.001$

Table 2 Unstandardised and standardised direct, indirect, and total effects from the schizotypy subfactors

Path	Direct Effect		Indirect Effect		Total Effect	
	Unstandardised	Standardised	Unstandardised	Standardised	Unstandardised	Standardised
UnExp > IPO-RT	1.70 (1.15, 2.22)**	0.35 (0.24, 0.45)**				
IPO-RT > GCBS	0.38 (0.28, 0.47)**	0.43 (0.32, 0.54)**				
UnExp > IPO-RT > GCBS			0.64 (0.40, 0.93)**	0.15 (0.10, 0.22)**	1.08 (0.52, 1.60)**	0.26 (0.13, 0.37)**
IntAn > IPO-RT	0.56 (0.07, 1.05)*	0.08 (0.01, 0.15)*				
IPO-RT > GCBS	0.38 (0.28, 0.47)**	0.43 (0.32, 0.54)**				
IntAn > IPO-RT > GCBS			0.21 (0.03, 0.42)*	0.03 (0.01, 0.07)*	0.32 (-0.26, 0.93)	0.05 (-0.04, 0.15)
ImpNon > IPO-RT	2.21 (-0.69, 0.76)**	0.30 (0.20, 0.40)**				
IPO-RT > GCBS	0.38 (0.28, 0.47)**	0.43 (0.32, 0.54)**				
ImpNon > IPO-RT > GCBS			0.83 (0.50, 1.24)**	0.13 (0.08, 0.19)**	0.84 (0.08, 1.59)*	0.13 (0.01, 0.25)*

Note. Bootstrapped bias-corrected confidence intervals in parentheses. UnExp = Unusual Experiences; IntAn = Introverted Anhedonia; ImpNon = Impulsive Nonconformity; IPO-RT = Inventory of Personality Organisation-Reality Testing subscale; GCBS = Generic Conspiracist Beliefs Scale. * $p < 0.05$; ** $p < 0.001$

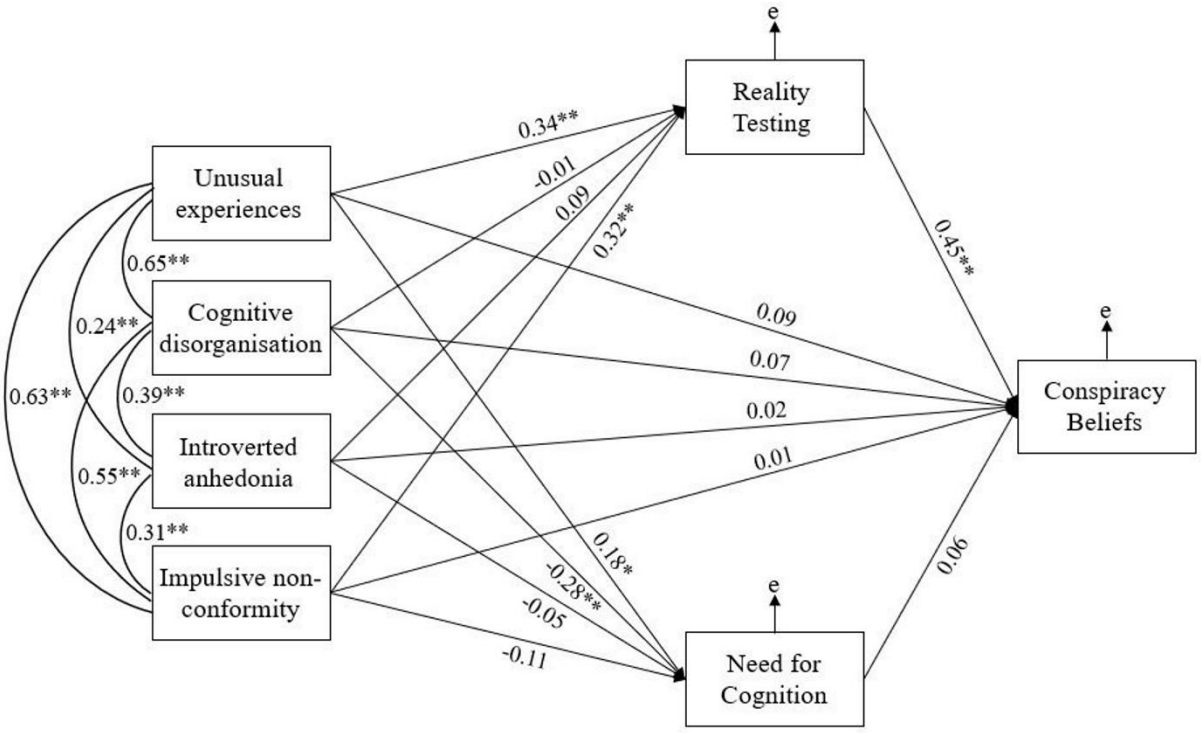

Figure 1. Initial path model depicting relationships between schizotypy subfactors, thinking style, and conspiracy beliefs. Observed variables are depicted by rectangles. Error is represented by 'e'

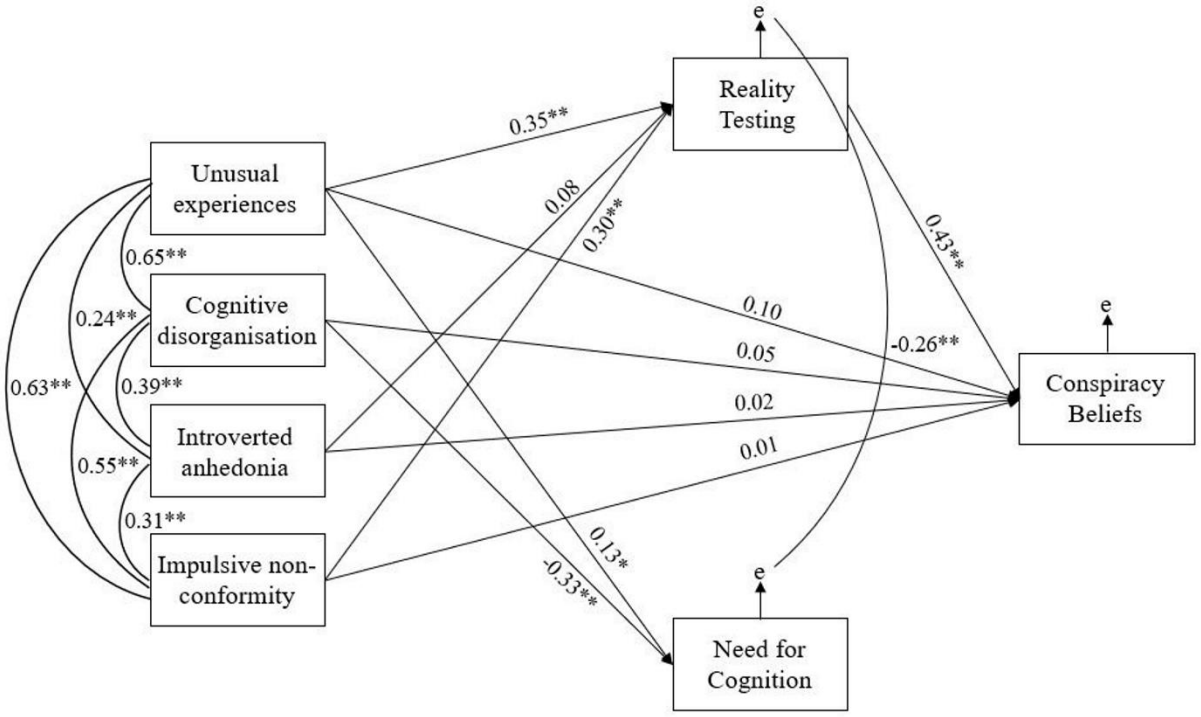

Figure 2. Revised path model depicting relationships between schizotypy subfactors, thinking style, and conspiracy beliefs. Observed variables are depicted by rectangles. Error is represented by 'e'