Title:

Factors affecting conspiracy theory endorsement in paranoia

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14   **Abstract**

15   Paranoia and conspiracy thinking are known to be distinct but correlated constructs, but it is

16   unknown whether certain types of conspiracy thinking are more common in paranoia than

17   others. In a large (n=1000), pre-registered online study we tested if endorsement of items on

18   a new Components of Conspiracy Ideation Questionnaire varied according to a) whether

19   harm was described as being intentional, and b) whether they were self-referential. Our

20   predictions were supported: paranoia was positively associated with endorsement of items

21   on this questionnaire overall and more paranoid individuals were more likely to endorse

22   items describing intentional and self-referential harm. Belief in one item on the Components

23   of Conspiracy Ideation Questionnaire was associated with belief in others and items

24   describing incidental harm and harm to others were found to be more believable overall.

25   Individuals who endorsed conspiracy theory items on the questionnaire were more likely to

26   state that people similar to them would as well, although, counter to our expectations, this

27   effect was not reduced in paranoia.

28

29

Introduction

Conspiracy theories have been defined as "attempts to explain the hidden causes of significant social and political events and circumstances with claims of secret plots by two or more powerful actors" where these actors are often seen as malevolent (Douglas et al., 2019). Perhaps unsurprisingly, paranoia, the tendency to believe that harm will occur and that it is intended by other people, is associated with belief in conspiracy theories (Freeman & Bentall, 2017; Green et al., 2008; Imhoff & Lamberty, 2018). Conspiracy theories vary quite broadly in various properties, including whether any harmful outcome is intended by the malevolent actors (or occurs as an incidental by-product), and whom the target of this harm is (i.e. the general population or a specific individual or group of individuals). Although proneness to paranoid thinking and a tendency to endorse conspiracy theories clearly overlap – and share some underlying putative risk factors – it is not yet clear if the association between paranoia and conspiracy thinking is dependent on certain properties of conspiracy theories themselves. In this pre-registered study, we therefore asked whether belief in conspiracy theories with certain features is more likely to be associated with paranoid thinking.

In addition to paranoia, several other psychological and social factors are associated with conspiracy thinking. These include personality traits, such as the need for certainty and uniqueness (Douglas et al., 2017); variation in cognition, such as erratic belief updating and attributional and perceptual biases (Douglas et al., 2016; Van Elk, 2015; van Prooijen et al., 2018; Suthaharan et al., 2021); conservative political orientation (Imhoff & Lamberty, 2018; van der Linden et al., 2021; but see van Prooijen et al., 2015); and sociological phenomena, such as adverse personal circumstances, inequality, societal crises, opaque behaviour of authorities, polarisation, and misinformation (Uscinski et al., 2011; van Prooijen & Douglas, 2017). However, although we know rather a lot about factors predisposing people to conspiracy thinking in general terms, far less attention has been paid to how the themes and content of the conspiracy theories themselves affect endorsement, and whether this varies among individuals. Additionally, although evidence suggests that belief in one conspiracy theory predicts belief in others (Wood et al., 2012), it is unknown whether this relationship is stronger for conspiracy theories that share certain attributes.

Studies exploring the link between paranoia and conspiracy thinking have tended to explore associations between paranoia and measures of general conspiracy mindset. These measures pose broad statements such as "The government is involved in the murder of innocent citizens and/or well-known public figures, and keeps this a secret" and "I think that

65 the official version of events given by authorities very often hides the truth" (Brotherton et

66 al., 2013; Imhoff & Lamberty, 2018; Lantian et al., 2017). Because these approaches often

67 involve aggregating responses across multiple items (Suthaharan et al., 2021) or measuring

68 conspiracy thinking using one item alone (Freeman & Bentall, 2017), they cannot speak to

69 the relationship between paranoia and different features of conspiracy thinking.

70

71 Although meta-analytic evidence suggests a moderately strong association between

72 paranoia and conspiracy thinking, (*Fisher's Z* = 0.38, Imhoff & Lamberty, 2018), conspiracy

73 thinking does not necessarily stem from an underlying paranoid disposition. Indeed, although

74 they are correlated, a recent study employing a multi-trait, multi-method approach showed

75 that paranoia and conspiracy thinking are distinct constructs: paranoia is more closely

76 related to self-relevant constructs (e.g. personality traits such as introversion and

77 neuroticism) whereas conspiracy thinking shows stronger associations with constructs

78 pertaining to socio-political domains (e.g. low trust in government) (Imhoff & Lamberty,

79 2018). Accordingly, the conspiracy 'mindset' has been viewed as a generalized political

80 attitude, or a cognitive schema, rather than a concept of broad clinical relevance (Grzesiak-

81 Feldman, 2015; Imhoff & Bruder, 2014; Imhoff & Lamberty, 2018). Given they are distinct but

82 correlated constructs, it is possible that paranoia relates to certain aspects of conspiracy

83 thinking more than others.

84

85 The majority of work on paranoia and conspiracy thinking examines the relationship in the

86 population as a whole where the majority of people will not be distressed or disabled by the

87 intensity or intrusiveness of their beliefs. Paranoia can be highly distressing and, at the

88 upper extremity of the paranoia continuum, forms a core part of psychosis (Bebbington et al.,

89 2013). It is clear that conspiracy beliefs are common in people with paranoid delusions (Bell

90 et al., 2021) and one distinguishing feature may be that, as paranoia becomes more

91 delusional, concerns about conspiracies are more likely to involve the believer rather than

92 simply focusing on 'significant social and political events' (Raihani & Bell, 2019). This

93 suggests that perception of conspiracies and the type of conspiracy may change as paranoia

94 becomes more severe.

95

96 Consequently, to study conspiracy thinking in the current study, we sought to understand

97 how different features of conspiracy theories influence how strongly they are endorsed.

98 Namely, we focus on whether the harmful outcome is described as intended and who is said

99 to be affected by it. First, conspiracy theories imply intentional action to different extents. For

100 example, the conspiracy theory that the government has been taken over by Satanists to

101 facilitate child abuse implies a higher level of intent to harm than the belief that the moon

102 landings were faked. Second, the target of the harm described in conspiracy theories can
103 vary: some conspiracy theories imply society as a whole will be harmed, some name
104 individuals or groups of individuals as the victim(s) of the harmful conspiracy, whereas some
105 believers might hold conspiracy beliefs about themselves personally being targeted.
106 Endorsement of conspiracy theories may vary according to these features.
107
108 Further, by decomposing conspiracy theories according to their features, we examine
109 whether different elements of conspiracy theories may drive the association between
110 conspiracy thinking and paranoia. A potential distinguishing factor between paranoia and
111 general conspiracy thinking is that paranoia is largely self-focussed (Imhoff & Lamberty,
112 2018 although see Raihani & Bell, 2017). We therefore expected paranoia to be associated
113 with increased endorsement of conspiracy theories that describe the believer themselves as
114 the target or victim of a given event. Given that paranoia in the general population is
115 associated with stronger attributions of harmful intent (Greenburgh et al., 2019; Raihani &
116 Bell, 2017; Saalfeld et al., 2018), and higher levels of perceived intentionality of negative
117 events (So et al., 2020), we also expected paranoia to be associated with stronger belief that
118 the harmful events described in conspiracy theories are *intended* outcomes, rather than
119 incidental side-effects.
120
121 It is clear that factors unrelated to the content of conspiracy theories themselves may
122 increase the degree to which people believe in them – one such factor is social influence.
123 Cognitive models emphasise that beliefs are not held simply for the verity or credibility of
124 their claims and content, but that we adapt our beliefs to the social context, where beliefs
125 that are socially rewarded are held more strongly (Williams, 2020). Therefore, beyond the
126 concrete features of conspiracy theories, conspiracy thinking likely additionally depends on
127 the beliefs of one's in-group. Increasing evidence supports this claim: conspiracy thinking is
128 predicted by social interaction with other conspiracy believers, and marginalisation outside of
129 such communities - even to a greater extent than by individual variation in psychological
130 factors such as anger, sadness and anxiety (Phadke et al., 2020). However, given that
131 paranoia involves social avoidance, isolation, and reduced identification with some social
132 groups (Greenaway et al., 2018; Martin & Penn, 2001; McIntyre et al., 2016) and that social
133 identification with a group leads to conformity of behaviour to the group (Abrams & Hogg,
134 1990), it may be that the tendency to shape one's conspiracy beliefs to match one's in-group
135 is reduced in paranoia.
136
137 We made a number of pre-registered predictions for our experimental study. First, we
138 expected paranoia to be associated with a tendency to endorse conspiracy theories, and

139   particularly with endorsement of self-referential conspiracy theories and where harmful

140   outcomes were described as intentional. Second, we expected that people who endorsed a

141   conspiracy theory of one type would be more likely to endorse other conspiracy theories of

142   that same type: categories of conspiracy thinking would be distinguishable according to the

143   level of intentionality and the target they describe. Finally, we predicted that individuals

144   would be more likely to believe conspiracy theories that they thought others similar to

145   themselves would also believe but that this effect would be reduced in paranoia.

Method

Full materials, data and code are available at
https://osf.io/zx8me/?view_only=d02e5abdf6304fb0885ccf32853934ca. The study design,
sample size, exclusion criteria and analyses were pre-registered at
https://aspredicted.org/blind.php?x=wa2jh4. We note below where relevant some deviations
from the pre-registered analyses.

Participants

This study was carried out in November 2020 and was approved by the UCL ethics board
(project number 3720/002). All participants were fully informed as to the nature of the study
and participation was voluntary. In line with our pre-registration, we recruited 1,000 US-
based participants from Prolific Academic (www.prolific.ac), the online crowdsourcing
platform. In order to recruit participants across a range of conspiracy ideation, we pre-
registered that we would aim at initially recruiting 1000 participants to take part in the study,
after which, we determined the proportion of the sample who scored over 75/120 in
endorsement of the Components of Conspiracy Ideation Questionnaire – an average of 3.15
in response to each conspiracy theory. If the proportion of the sample meeting this condition
was less than 7%, we stated we would recruit more participants, until this criterion was met –
in accordance with distribution of paranoid thinking in previous studies (Saalfeld et al., 2018),
with an upper limit of 2000 participants in total. Any participants recruited after the initial
1000 would only have been included in the sample if they scored over 75/120 in the
Components of Conspiracy Ideation Questionnaire. However, as 14.5% of our initial sample
scored above 75/120, we did not recruit any more than the initial 1000.

The mean age of the sample was 36 (SD=12), with a small male majority (n=522, 52%). The
sample had a mild conservative bias in political orientation (table 2). Participants were paid
£2.20 for taking part in this study and could earn a bonus for passing attention checks. All
participants completed questionnaires measuring paranoid ideation, conspiracy thinking and
social and economic conservatism (described below).

Measures

Paranoia

All participants completed the Revised Green et al Paranoid Thoughts Scale (R-GPTS) (Freeman et al., 2021). This scale comprises two subscales which measure ideas of reference and ideas of persecution, respectively. Scores on the persecution subscale of the R-GPTS can range from 0 – 40, and from 0 – 32 on the reference subscale. A previous study reported the following mean scores on the persecution subscale: 4.53 (sd = 6.74) for participants from the general population; 13.7 (sd = 13.0) for patients with psychosis; 26.1 (sd = 9.46) for participants with persecutory delusions (Freeman et al., 2021). We used the persecution subscale of the R-GPTS as a proxy for trait paranoia.

Components of conspiracy ideation

We designed a novel 24-item questionnaire, which we call the Components of Conspiracy Ideation Questionnaire, to test our main predictions. Scores on the Components of Conspiracy Ideation Questionnaire designed for this study could range from 24-120 in total. Each item on the questionnaire was a statement of an explanation of harmful event, and participants indicated the extent to which they endorsed this explanation on a scale of 1 – 5 (strongly disagree – strongly agree).

The items varied according to three conditions: target (society as a whole, or targeting the respondent), the intentionality of harm (whether the harm was intentional or an incidental by-product of the action described), and the specificity (whether a general scenario was described or if specific details were included). Specificity was only varied within the target = society condition (See Table 1, and SI for full questionnaire), as having high specificity in the target = self condition was hard to achieve.

Altogether there were 6 types of item: 1: intentional/self/general, 2: incidental/self/general, 3: intentional/society/general, 4: incidental/society/general, 5: intentional/society/specific, 6: incidental/society/specific. Items also varied as to whether they included a named agent (e.g. the government).

We used four themes for each condition: data privacy, vaccination, international relations, and poisoning. Within each theme, the wording and content in each item were standardised, so that the main variation within each theme depended on the condition (intentionality/target type/specificity).

218   Therefore, the items were designed to systematically vary and isolate the components of

219   conspiracy theories in order to investigate the impact these features have on belief. For

220   example, any increased endorsement of intentional items compared to incidental items could

221   be attributed to the variation in the intentionality dimension alone. While many items on the

222   questionnaire were direct conspiracy theories, items in the intentionality = incidental

223   category did not necessarily reflect true conspiracy theories, however this allowed us to test

224   whether belief in conspiracy thinking is specifically linked to the level of intentionality the

225   explanation of harm describes, and whether this is associated with paranoia.

226

227   Agent presence and specificity conditions were explored in secondary analyses and we

228   report the results of these manipulations in the SI. All pre-registered primary manipulations

229   (target and intentionality) are reported in the main body of this paper.

230

Type number	1	2	3	4	5	6
Intentionality =	Intentional	Incidental	Intentional	Incidental	Intentional	Incidental
Target =	Self	Self	Society	Society	Society	Society
Specificity =	General	General	General	General	Specific	Specific
Example conspiracy theory item	Some of the vaccines I have received have been designed to be harmful to me, but I was unaware of this at the time	Some of the vaccines I have received have later been discovered to be harmful, but I have not been officially informed of this	Vaccines have been designed to harm the public and most people do not know this	Vaccines given to the public have unintended harmful side effects and the public are unaware of this	The MMR (measles, mumps and rubella) vaccine was intentionally designed to give children autism, and the public was unaware of this	The MMR (measles, mumps and rubella) vaccine causes autism in children, but the public has not been officially warned of this

231

232   *Table 1.* All conspiracy theory items from one example theme (vaccination) in the

233   Components of Conspiracy Ideation Questionnaire.

234

235   Positive control questionnaire

236

237   We included a positive control variant for each item in the Components of Conspiracy

238   Ideation Questionnaire. These items involved the same theme and condition as each item

239   but described a benefit rather than a harm. Participants indicated the extent to which they

240   endorsed each positive control theory from 1 to 5 (Strongly disagree – Strongly agree). The

241   mean endorsement of each positive control item was 3.24 (sd=0.54; range = 1-5). We report

242   the main analyses concerning this positive control questionnaire in the SI.

243

244   Perception of in-group popularity

245

246   For each item in the Components of Conspiracy Ideation Questionnaire, participants

247   indicated whether people similar to them would endorse the theory (yes/no/unsure). Only

248   answers of yes/no were included in the analyses (70% of the data: no = 4171 items (26%),

249   yes = 6997 items (44%). Similarity has widely been used as an in-group cue in previous

250   research (Cikara, 2021).

251

252

253   Social and Economic Conservatism

254

255   We measured social and economic conservatism (SEC) using the self-report SEC

256   questionnaire (Everett, 2013). This scale is composed of 12 items, each corresponding to

257   one issue (7 social, 5 economic), and participants are asked to rate the extent to which they

258   feel positively or negatively towards each issue. Scores of 0 imply greatest negativity, and

259   scores of 100 indicate the greatest positivity. By distinguishing between social and economic

260   conservatism this scale can capture greater complexities than single conservative-liberal

261   scales. This scale statistically reflects the distinguishable factors of economic and social

262   conservatism, which mirrors a conceptual understanding in political psychology of the

263   dissociable nature of social and economic conservatism in the US (Everett, 2013).

264

265   General conspiracy mindset

266

267   We measured general conspiracy mindset using the Conspiracy Mentality Questionnaire

268   (CMQ). The CMQ is 5 items long and has been shown to have cross cultural validity in

269   measuring general conspiracy mentality as a one-dimensional construct that is stable across

270   time (Bruder et al., 2013). In the questionnaire, participants read five statements and rate the

271   extent to which they agree from 0% (certainly not) to 100% (certain), on a scale with 10%

272   intervals. In a large sample (n=1640) in the English version of this questionnaire, the mean

273   agreement per item was 6.3 (SD=1.9) out of 10 (or 63%) (Bruder et al., 2013).

274

275   *Procedure*

276

277   All participants begun by reporting their age and gender, and then completed the R-GPTS,

278   Components of Conspiracy Ideation Questionnaire, and positive control questionnaire, order

279   randomised between participants. There were eight attention-check questions interspersed

280 throughout these questionnaires, where 90% of participants answered all of these correctly.

281 We re-ran all analyses excluding those who failed more than one attention check and

282 reported any qualitative differences (see SI). To finish, the participants completed General

283 Conspiracy Mindset and Social and Economic Conservatism questionnaires.

284

285

286 *Primary pre-registered analyses*

287

288 We used an information-theoretic (IT) approach with multi-model averaging for our

289 regression analyses (Burnham & Anderson, 2002; Grueber et al., 2011). We ran one pre-

290 registered cumulative link model (clm, (Christensen, 2018) where we standardized all

291 continuous input variables and centred all binary input variables (Gelman, 2008).

292 Endorsement of items in the Components of Conspiracy Ideation Questionnaire was the

293 output variable, and the input variables were paranoia, target, ingroup popularity,

294 intentionality, gender, age and interaction effects between paranoia and target, paranoia and

295 ingroup popularity, and paranoia and intentionality. The model also included random effect

296 terms for participant ID and theme. Paranoia refers to score on the persecutory subscale of

297 the R-GPTS and was included as a standardized continuous input variable. The model

298 included data for the specificity = general condition, in order to hold constant the number of

299 items included in each target condition, as specificity was only varied in the target = society

300 condition.

301

302 We note some variations from the pre-registered model: intentionality and an interaction

303 term for intentionality*paranoia were included as input variables in the model given some

304 deviation from the initial network analysis (described in the next section). Item theme was

305 included as a random effect rather than item number as intercepts were expected to vary

306 within each theme, and a random effect term of item number would have unintentionally

307 controlled for variation in the main variables of interest; nationality and ethnicity were not

308 included as an input variable as US participants only were recruited and we made no

309 predictions pertaining to these variables.

310

311

312 *Network analyses*

313

314 Psychological networks are data-driven models consisting of nodes representing observed

315 variables, where these nodes are connected by edges that represent the statistical

316 relationships between them (Epskamp & Fried, 2018). The edge weights depict the

relationship between two nodes whilst controlling for all other nodes in the network. Epskamp and Fried (2018) note that network analysis involves two main stages: estimating a statistical model on data and representing this as a weighted network between observed variables; and analysing the structure of this network - for example testing significant differences between edge weights. We intended to employ network analysis to investigate the relationship between paranoia and endorsement of different types of items on the Components of Conspiracy Ideation Questionnaire), as well as whether belief in one type of conspiracy theory predicted belief in conspiracy theories with similar attributes (whether there are distinguishable 'types' of conspiracy thinking - pre-registered prediction 1).

We note a deviation from our pre-registered network analysis. We initially pre-registered a network analysis where all items in the Components of Conspiracy Ideation Questionnaire would be included along with paranoia items as nodes in the network. However, the resulting network estimated had low stability, likely due to low statistical power due to the large number of items included as individual nodes, so we did not draw inferences from it as this poses problems for replicability (Epskamp et al., 2018; Fried & Cramer, 2017).

Consequently, we ran an unregistered network analysis involving fewer nodes to increase power. This network enabled us to examine whether paranoia was more closely associated with endorsement of certain types of item in the Components of Conspiracy Ideation Questionnaire depending on the degree of intent they described and whether they were self-referential, where our pre-registered prediction was that paranoia would be most closely associated with self-referential conspiracy theories describing harm that was caused intentionally (type 1). We included one node pertaining to each type of item in the network model, where only the general conditions were included: intentional harm targeting the self (type 1), incidental harm targeting the self (type 2), intentional harm targeting society (type 3), incidental harm targeting society (type 4); as well as one node for the persecution subscale of the R-GPTS. Each participant's ratings were summed across items that corresponded to each type and converted into ordered categorical variables to be included in the network analysis.

We estimated the network using a mixed graphical model (Haslbeck & Waldorp, 2019), where all variables were categorical (all variables had 4 levels) so no assumptions about distributions were made. We used absolute shrinkage and selection operator (LASSO) regularization with EBIC model selection (Epskamp et al., 2018) in order to provide conservative estimates and a sparse network. LASSO regularization shrinks all edge-weights towards zero and sets all small weights to zero by limiting the sum of absolute

354   parameter values. The level of penalization involved is determined by the parameter lambda,

355   selected using Extended Bayesian Information Criterion (Epskamp et al., 2018). EBIC

356   model selection also involves a tuning parameter, gamma, which we set to 0.5 (Foygel &

357   Drton, 2010).

358

359   The resulting network estimated had high stability, as revealed by *case-dropping subset*

360   *bootstrap* using the *bootnet* function in R (Epskamp, 2020) (see SI). Here we bootstrapped

361   the model 1000 times where increasing numbers of cases are removed from the dataset and

362   the centrality metrics (in our case Strength and Expected Influence) are recalculated with

363   each iteration to give a correlation stability coefficient (Epskamp et al., 2018). Secondly,

364   accuracy of estimated edge-weights was calculated by a bootstrap analysis where we

365   bootstrapped the model 500 times to construct *bootstrapped confidence intervals* (CIs),

366   where in 95% of cases the CI contains the true value of the edge-weight parameter (see SI).

367

368   Next, we performed bootstrapped difference tests to explore our pre-registered

369   prediction,that paranoia would be most closely associated with type 1 items, followed by type

370   2, 3 and 4 consecutively, where associations are operationalised as edge weights in the

371   network.

372

373   As our analyses diverged from the initial network analysis pre-registered, we were not able

374   to test whether nodes representing individual items in the Components of Conspiracy

375   Ideation Questionnaire clustered together based on type. However, we were able to

376   investigate whether endorsement of one type of item on the Components of Conspiracy

377   Ideation Questionnaire was associated with endorsement of other types with similar

378   attributes. We achieved this by examining the edge-weights between nodes representing

379   each type of item and performing bootstrapped difference tests to determine the differences

380   in edge weights between these nodes. A weak or absent edge-weight between two nodes

381   representing a different item types suggests a greater distinction between nodes (and hence

382   implying a more "distinguishable category"), whereas stronger relationships between nodes

383   suggests that belief in these theories is more closely related. We note that it is not possible

384   to control for multiple testing in these significance tests (Epskamp et al., 2018).

385

386   We also calculated predictability estimates for each node and visualised them using the

387   *qgraph* package in R (Epskamp et al., 2012). Predictability refers to the extent to which the

388   variance of any given node is explained by the edges connected to it: how well any given

389   node can be predicted by neighbouring nodes in the network (Haslbeck & Waldorp, 2018).

390   Predictability is an interesting metric for two principal reasons (Haslbeck & Waldorp, 2018).

391　Firstly, it allows us to determine the relevance of edges connected to a node, where a node
392　that has high predictability has more relevance in the network as it can be determined by a
393　greater extent by surrounding nodes. Secondly, predictability is an indication of how self-
394　determined the network is, where a low predictability overall implies that the network is
395　largely determined by variables not included in the analysis.
396
397　*Secondary analyses*
398
399　We aimed to replicate the finding reported in the extant literature that belief in one
400　conspiracy theory is related to endorsement of others (Wood et al., 2012) by calculating
401　Cronbach's alpha for the Components of Conspiracy Ideation Questionnaire. We also tested
402　the prediction that paranoia and GCM scores would be associated, in accordance with
403　aforementioned literature reporting the positive correlation between paranoia and general
404　conspiracy mindset.
405
406　We ran pre-registered exploratory analyses using the SEC and GCM data to test whether
407　Social and Economic Conservatism and General Conspiracy Mindset were associated with
408　CT endorsement on the Components of Conspiracy Ideation Questionnaire, as previous
409　literature has given mixed results.
410
411　We report secondary pre-registered analyses regarding the impact of specificity, severity
412　and recognition of conspiracy theories on endorsement in the SI.
413

Results

Paranoia scores spanned the full R-GPTS persecution subscale range (table 1, figure 1). The distribution of paranoia scores was positively skewed where 37.4%, 37.2%, 16.7% and 8.7% of participants in the current study respectively fell in the *elevated*, *moderately severe*, *severe* and *very severe* categories of persecutory ideation specified by Freeman et al. (2021). Components of Conspiracy Ideation Questionnaire scores followed a less positively skewed distribution than paranoia scores (figure 1).
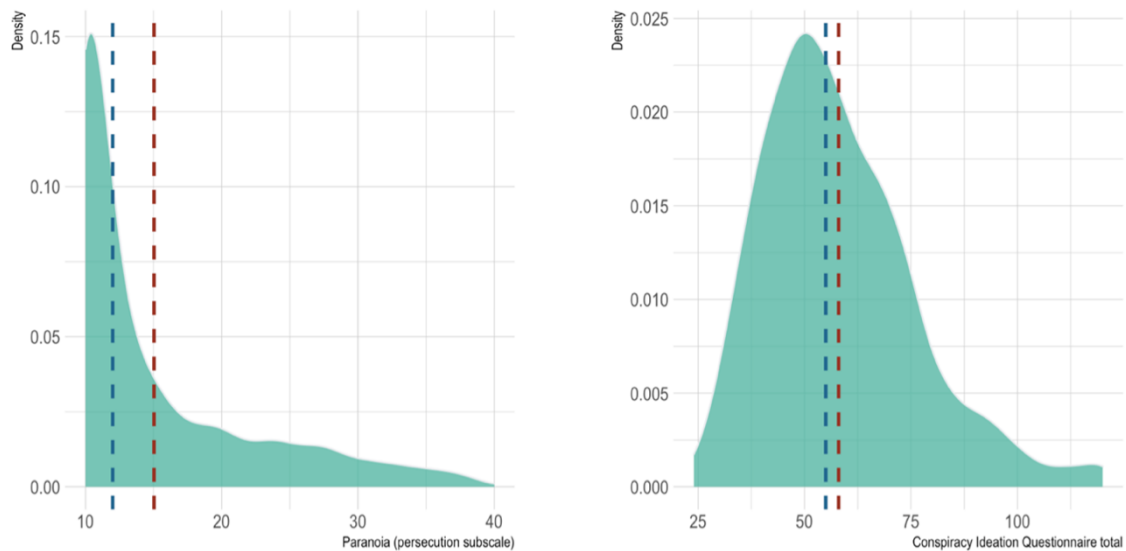
Figure 1. Distribution of paranoia (persecution) and Conspiracy Ideation (sum score in the Components of Conspiracy Ideation Questionnaire) variables

Participants who endorsed one item on our Components of Conspiracy Ideation Questionnaire were also likely to endorse others as demonstrated by the high Cronbach's alpha of 0.936. A Mann-Whitney U test indicated that mean endorsement of items on the positive control questionnaire was significantly higher than on the Components of Conspiracy Ideation Questionnaire ($W = 854966$, $p < .001$).

People scoring higher in general conspiracy mindset measured by the CMQ also were more likely to endorse items in the Components of Conspiracy Ideation Questionnaire (r_t=0.34, p<.001). General conspiracy mindset was positively associated with paranoia (r_t=0.21, p<.001), as predicted. General conspiracy mindset was positively associated with Social and Economic Conservatism (r_t=0.18, p<.001).

Questionnaire	Range	Mean	SD
Persecution subscale, R-GPTS (total)	10 – 40	15.04	6.99
Reference subscale, R-GPTS (total)	8 – 32	13.92	5.73
Components of Conspiracy Ideation Questionnaire (per item)	1 –5	2.42	0.75
General Conspiracy Mindset Questionnaire (per item)	0 –100	65.2%	19.53
Social and Economic Conservatism scale (per item)	4 – 99	56.53	20.17

Table 2. Summary statistics for main measures

Primary pre-registered analysis

Participants scoring higher in paranoia were more likely to endorse items in the Components of Conspiracy Ideation Questionnaire (estimate = 0.83, 95%CI = 0.72, 0.93, table 3), as predicted.

Endorsement was stronger overall for items that described society as a whole as the target of any harm described (estimate = 0.40, 95%CI = 0.32, 0.48, table 3). As expected, those scoring high in paranoia were more likely to endorse items with self-referential targets (paranoia x target: estimate = - 0.14, 95%CI = -0.22, -0.06, table 3, figure 3).

Items describing incidental harm were more readily endorsed overall than those describing intentional harm (estimate = -1.51, 95%CI = -1.59, -1.42; table 3; figure 2). Participants scoring high in paranoia endorsed items specifying intentional harm to a similar degree to those describing incidental harm, whereas people scoring lower in paranoia were less likely to endorse items describing intentional harm (paranoia x intentionality: estimate = 0.34, 95%CI = 0.26, 0.42; table 3, figure 3).

Participants were more likely to endorse items in the Components of Conspiracy Ideation Questionnaire if they thought members of their in-group would too (estimate = 1.15, 95%CI = 1.08, 1.21; Table 3, Figure 3). Against our expectations, the relationship between paranoia and endorsement was strongest when ingroup members were believed to endorse items (paranoia x ingroup belief: estimate = -0.16, CI: -0.22, -0.09). Post-hoc Kruskall-Wallis rank sum test showed that those scoring higher in paranoia were more likely to report others similar to themselves as endorsing these items overall (Chi-squared=583, p<.001, df = 1).

Participants' age and gender did not predict conspiracy theory endorsement.

467

468 Sensitivity analysis using G*Power (Faul et al., 2007) indicated that we could detect a

469 minimum effect size of 0.01 with 80% power given our sample size of 1000.

470

| Parameter	Estimate	Unconditional SE	95% CI
Ingroup (0 = ingroup doesn't agree, 1 = ingroup does agree)	1.15	0.03	(1.08, 1.21)
Intentionality (0 = incidental, 1 = intentional)	-1.51	0.04	(-1.59, -1.42)
Target (0 = self, 1 = society)	0.40	0.04	(0.32, 0.48)
Paranoia	0.83	0.06	(0.72, 0.93)
Ingroup:Paranoia	-0.16	0.03	(-0.22, -0.09)
Intentionality:Paranoia	0.34	0.04	(0.26, 0.42)
Target:Paranoia	-0.14	0.04	(-0.22, -0.06)
Age	-0.01	0.03	(-0.07, 0.05)
Gender	-0.004	0.05	(-0.10, 0.09)

471 *Table 3.* Results of the primary pre-registered model exploring endorsement of items on the

472 Components of Conspiracy Ideation Questionnaire (model 1). Model average estimates,

473 unconditional standard errors, confidence intervals and relative importance for the terms included

474 in the top model set are presented. See SI for details of top model set.

475
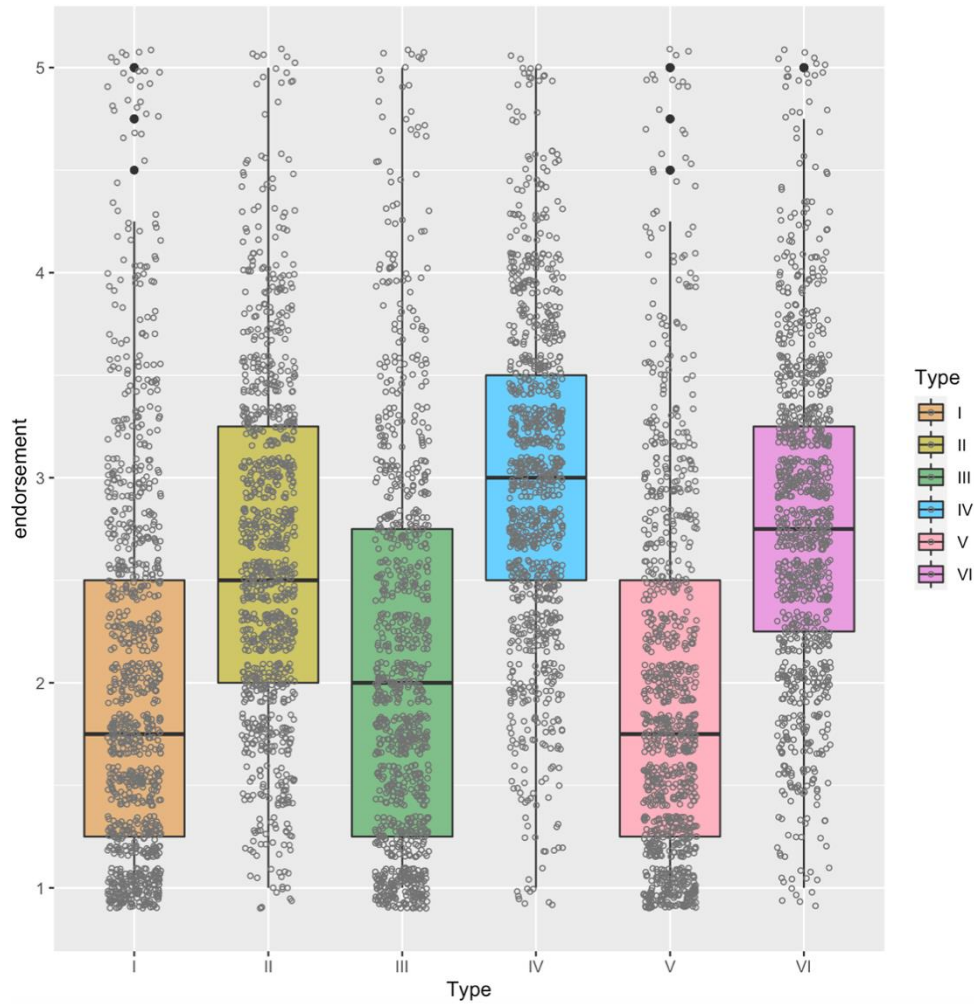
Figure 2. Mean endorsement of items on the Components of Conspiracy Ideation Questionnaire, according to conspiracy theory type. I=intentional, self, general; II=incidental, self, general; III=intentional, society, specific; IV=intentional, society, general; V=incidental, society, specific, VI=incidental, society, general. Mid hinges signify median endorsement values. Lower and upper hinges correspond to the 25th and 75th percentiles, and upper/lower whiskers extend from the upper/lower hinge to the largest value no greater/lower than 1.5 times the interquartile range from the hinge. Outliers beyond 1.5 times the interquartile range from the hinge are denoted as black filled points. Raw datapoints are denotes as grey circles.
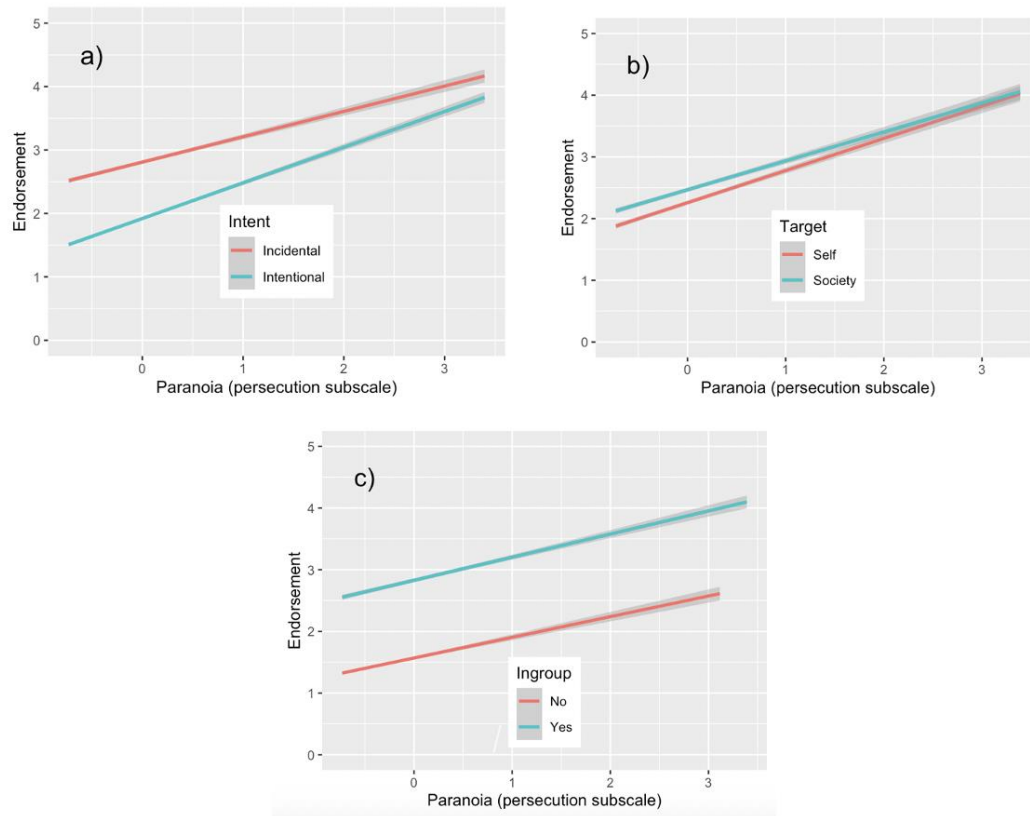
Figure 3. Mean endorsement of items on the Components of Conspiracy Ideation Questionnaire as a function of standardized paranoia scores on the persecutory subscale, and three separate factors: a) intentionality described in the conspiracy theory, b) target of the conspiracy theory, and c) whether the participant believes others similar to them believe in the conspiracy theory. Lines depict generalized linear model predictions. Shaded areas around each line represent 95% confidence level intervals for predictions of the generalized linear models.

Network analysis

The network structure is displayed in Figure 4. Paranoia (R-GPTS persecution subscale) was significantly predicted by endorsement of all types of item in the Components of Conspiracy Ideation Questionnaire. As all nodes were included as categorical variables, and interactions between categorical variables with more than two levels are specified by more than one parameter (Haslbeck & Waldorp, 2019), we cannot report single parameters for these relationships but rather report full parameter tables for edges connected to the paranoia node in our supplementary information.
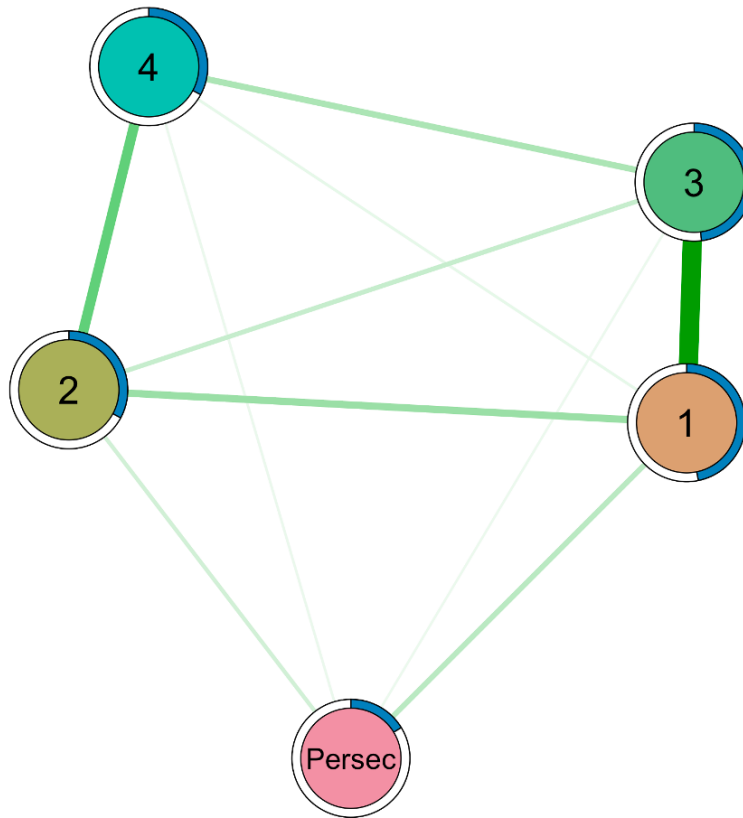
511
512 Bootstrapped difference tests revealed that the edge weight was stronger between paranoia
513 and type 1 items (intentional/self/general) than paranoia and type 3 items
514 (intentional/society/general) (CI: -0.90, -0.11). No other bootstrapped difference tests of
515 edges joining the paranoia node reached significance, however, this was marginal in some
516 cases: in the visualisation of the network, the edge between paranoia and type 1 items was
517 thicker than that between paranoia and type 4 items (CI: -1.07, 0.03).

518
519 Nodes representing the four different item types were interconnected. Table 4 presents
520 bootstrapped difference tests of edge weights between nodes included in the network.
521 Strength of edge weights and direction of significant differences can be viewed in figure 4,
522 where stronger edges are represented as thicker lines in the network.
523

These results are relevant to our first pre-registered hypothesis: conspiracy theory endorsement would be clustered along the axes of intentionality and the putative target of any harm. As discussed, although we could not perform cluster analysis on a large network including each item as an individual node in order to directly test whether the nodes clustered together on the basis of item type, our results indicate that that people who endorsed items of a given type were more likely to endorse other items with similar attributes. Weak edges in the network imply that nodes are more distinguishable, and stronger edges indicate that nodes are more strongly related.

Endorsement of one item was most likely to be associated with endorsement of others that imply a similar level of intentionality. Participants who endorsed items describing intentional harm are more likely to believe in others describing intentional harm (type 1 and type 3 share a strong edge that is significantly stronger than all other edges – notably that between type 2 and 3 as well as between type 1 and 4, as these edges describe relationships between items with different levels of intentionality); and those endorsing explanations of events that describe incidental harm are also more likely to believe in others describing incidental harm (type 2 and type 4 share a strong edge, and this edge is stronger than the relationship between type 1 and type 4).

Endorsement of self-referential items was associated with endorsement of other items sharing this attribute (type 1 and type 2 share a significant edge) and this was also the case for items that describe harm targeting society (type 3 and 4 share a significant edge). These edges were weaker than those pertaining to intentionality: the edge between type 1 and type 3 nodes (both describing intentional harm with different target types) was stronger than both that between type 3 and 4 (both describing society-referential harm with different levels of intention) as well as type 2 and 1 (both describing self-referential harm with different levels of intention).

Edge	CT1-CT2	CT1-CT3	CT1-CT4	CT2-CT3	CT2-CT4	CT3-CT4
CT1-CT2		(1.31, 3.56)	(-1.95, 0.13)	(-1.91, 0.84)	(-0.57, 1.57)	(-1.37, 0.63)
CT1-CT3			(--4.19, -2.42)	(-3.98, -1.69)	(-2.97, -0.65)	(-3.61, -1.70)
CT1-CT4				(-0.44, 1.32)	(0.55, 2.37)	(-0.15, 1.21)
CT2-CT3					(0.09, 2.21)	(0.87, 1.13)
CT2-CT4						(-1.87, 0.03)

Table 4. Results of bootstrapped significance tests of edge weights between nodes representing different types of conspiracy theory (CT1: intentional/self/general, CT2: incidental/self/general, CT3: intentional/society/general, CT4: incidental/society/general). Colour of each table cell represents

556   the outcome of each difference test (green = significant, orange = not significant). Statistics in each
557   cell are the 95% confidence intervals for each difference test.
558
559   Correlation stability coefficients computed for centrality estimates were high (expected
560   influence = 0.67, strength = 0.67; see SI) allowing us to be confident in the interpretations
561   based on this network. Drawing bootstrapped CIs showed a high accuracy of edge weights
562   in the network (see SI).
563
564   Predictability estimates – quantifying the extent to which any given node can be predicted by
565   nodes that are connected to it – are represented by the pie bar surrounding each node
566   (figure 4). The mean predictability (normalised accuracy) of all the nodes was 0.35, and type
567   1 and 3 items had the highest predictability (Type 1: 0.48, type 2: 0.33, type 3: 0.48, type 4:
568   0.33, persec: 0.16).
569
570   *Secondary analyses*
571
572   The model including all secondary variables did not converge without errors, as such we
573   report the results for this in our supplementary information.
574
575   All results held when re-running the models excluding participants who failed more than one
576   attention check (see SI for full model results. See SI for models run using the reference
577   subscale of the R-GPTS rather than the persecutory subscale.
578

Discussion

We present a novel study investigating the relationship between paranoia and different components of conspiracy thinking. Overall, items in our Components of Conspiracy Ideation questionnaire were endorsed to a greater extent if they described a harm that was incidental (rather than intentional), and where the outcome was more likely to affect society as a whole rather than solely the participant themselves. As expected, we found that paranoia predicted endorsement of items in this questionnaire. Paranoia was also associated with the type of item people were more likely to endorse: more paranoid individuals were more likely to items describing self-referential harm, and those describing intentional harm. Both findings support our pre-registered predictions. Participants were more likely to endorse items that they thought others similar to themselves believed, but this effect was not reduced in paranoia, counter to our prediction.

A number of factors give us confidence in the generalisability of our results. Our sample had similar distribution of previous samples in general conspiracy mindset (Bruder et al., 2013) and paranoia (Greenburgh et al., 2019). We replicate a robust finding in the literature that people who hold one conspiracy belief are more likely to also believe in others (Wood et al., 2012). We also find that social and economic conservatism was associated with conspiracy thinking, coinciding with evidence that conservatives in the United States are more likely to endorse and espouse conspiratorial theories and world views (van der Linden et al., 2021; but see van Prooijen et al., 2015).

The network analysis indicated that belief in one item on our Components of Conspiracy Ideation Questionnaire was associated with belief in others, but that this varied according to the features of the conspiracy theories described. Edges were particularly strong between nodes representing item types that captured a similar level of intentionality or that specified the same target of the harm described (society/self). This clustering of endorsement for conspiracy theories items appeared to be stronger along the intentionality axis than along the target of harm axis. Supporting the interpretation that endorsement of conspiracy theories is differentiable according to these features, the edge between the most distinct items (type 1—type 4) was the weakest between nodes.

Most people endorsed items on the Components of Conspiracy Ideation Questionnaire describing incidental harm to a greater extent than those describing intentional harm. This general reluctance to attribute harmful intentions to others has been found in multiple studies. Specifically, in live interactions with others, participants are more likely to rationalise

616   being untreated unfairly as due to the self-interest of other players, rather than their harmful

617   intent (Barnby et al., 2020; Greenburgh et al., 2019; Raihani & Bell, 2017; Saalfeld et al.,

618   2018).

619

620   Regression analysis revealed that more paranoid individuals more strongly endorsed items

621   on the Components of Conspiracy Ideation Questionnaire overall – and did not endorse

622   incidental harm items to a greater extent than intentional harm items, unlike those scoring

623   lower in paranoia. Together these findings suggest that increasing paranoia was associated

624   with an increased tendency to believe conspiracy theories that suggest that harmful

625   outcomes are intended. This result directly relates to the most common characteristic of

626   paranoia: the belief that others *intend* harm, where recent research shows that paranoia is

627   associated with an increased perception of intentionality for negative events when they occur

628   (So et al., 2020). Indeed, experimental studies have also found that more paranoid

629   individuals make stronger attributions of harmful intent (Barnby et al., 2020; Greenburgh et

630   al., 2019; Raihani & Bell, 2017; Saalfeld et al., 2018). Our results extend this research: more

631   paranoid individuals are more likely to endorse conspiracy theories that imply that the

632   perceived harm was intended.

633

634   Participants were generally more likely to endorse items on the Components of Conspiracy

635   Ideation Questionnaire that specified society as a whole as the target of the harm described,

636   rather than the believer alone. It may be that personally-relevant items were scrutinised to a

637   greater degree by the participants in the current study, who consequently found them less

638   convincing – as personally-relevant messages have been shown to be processed more

639   systematically (e.g. Petty et al., 1981). As expected, the primary pre-registered regression

640   analysis found that more paranoid individuals were more likely to endorse self-referential

641   items, although this effect was marginal. Bootstrapped difference tests of our estimated

642   network supported this result as the edge between paranoia and self-referential items

643   describing intentional harm (type 1) was stronger than that between paranoia and society-

644   referential items describing intentional harm (type 3).

645

646   Participants were more likely to report that people similar to them endorsed items in the

647   Components of Conspiracy Ideation Questionnaire that they endorsed themselves, in line

648   with our predictions. This strong ingroup effect we found coincides with the large body of

649   literature documenting the influence of group membership on behaviour and attitudes.

650   Recent research highlights that the role of social influence is particularly strong with respect

651   to conspiracy thinking (Phadke et al., 2020). Our results cannot speak to a causal

652   relationship, but rather indicate that people who endorse conspiracy theories are likely to

653 report that others similar to them do so too. We expected that participants scoring higher in

654 paranoia would be less likely to endorse conspiracy theories that are perceived to be popular

655 by members of their ingroup, as paranoia has previously been associated with social

656 disconnection (Greenaway et al., 2018; McIntyre et al., 2018). Counter to these

657 expectations, however, more paranoid individuals were more likely to believe that others

658 similar to them would also endorse items they endorsed. We note that this effect was

659 marginal and warrants replication. However, if the effect is replicated, it may be that

660 individuals who score higher in paranoia have smaller social networks in general, but affiliate

661 more strongly to the few ingroup members they do have. This would mirror evidence that

662 conspiracy communities are often marginalised and have high commitment to their ingroup (

663 van Prooijen & Douglas, 2018). It may also be the case that individuals high in paranoia are

664 less accurate in judging social consensus, potentially leading to high levels of illusory

665 consensus in beliefs (Yousif et al., 2019) – something that also needs further investigation. It

666 is also possible that paranoia might only reduce the conviction that others share the belief in

667 conspiracy theory at more severe levels. Patients diagnosed with schizophrenia are often

668 well aware that others don't share their delusional beliefs (McCabe et al, 2004). However,

669 the extent to which this is a result of interaction with the mental health system (where

670 highlighting this discrepancy may be an explicit part of assessment or treatment) or severity

671 of paranoia remains to be investigated.

672

673 We note that the questionnaire design of the study was not designed to capture the full

674 extent of participants' conspiracy beliefs. In order to isolate the variables of interest with the

675 best level of control possible, we used prescriptive items in the Components of Conspiracy

676 Ideation Questionnaire. As such, we did not measure a vast number of possible conspiracy

677 beliefs – indeed the questionnaire largely focussed on those involving government powers.

678 Future research could investigate whether our results hold when applied to a broader range

679 of conspiracy beliefs, for example by eliciting them from the participants themselves rather

680 than asking participants to rate their endorsement of beliefs provided by the experimenter.

681 Additionally, we note that the conspiracy theories we included that specify incidental harm do

682 not necessarily fit with the definition of conspiracy beliefs that imply intentional harm by a

683 group of actors – for example we note they did not all state that authorities attempted to

684 cover-up the harms stated. However, as we have discussed in the introduction, many

685 modern-day conspiracy theories do vary in the degree to which they imply intentional action,

686 therefore our results can speak to how this variation relates to how convincing any given

687 explanation of a harmful event may be. Future research might investigate endorsement of

688 conspiracy theories along a continuum of intentionality, for example where the level of intent

689   present in each conspiracy theory is rated by a separate panel of participants, to replicate

690   and extend the current study.

691

692   We also note that recent work (Georgioua et al, 2021) has suggested that belief in

693   conspiracy theories may also be also associated with autistic traits in the general population.

694   Although this evidence suggests that they are not as strongly associated with conspiracy

695   beliefs compared to paranoid thinking, given their potential for being associated with

696   differences in social cognition, the extent to which they influence social judgements

697   regarding how widely shared conspiracy beliefs might be requires further investigation.

698

699   Our results have wider implications for research concerning belief updating, and fighting

700   conspiracy thinking in society. That is, as our results suggest that the level of intentional

701   harm and the type of target conspiracy theories describe may influence the traction they

702   receive, it is possible that the erratic belief updating processes associated with conspiracy

703   thinking (Suthaharan et al., 2021) may vary depending on these features of the conspiracy

704   beliefs; further, paranoia may differentially impact individual's abilities to update their

705   conspiracy beliefs, based on these features of such beliefs.

706

707   Overall, we show that the believability of conspiracy theories may depend on the level of

708   intentional action implied, and who is specified as the target of the harm described. Items in

709   our Components of Conspiracy Ideation Questionnaire that describe incidental harm, and

710   harm that targets society as a whole, were endorsed more strongly. Endorsement of any

711   given item was particularly associated with endorsement of other items that specified similar

712   levels of intentionality. Pre-registered regression analysis revealed that individuals scoring

713   high in paranoia were more likely to endorse items in this conspiracy ideation questionnaire

714   overall, and that item endorsement in paranoia is increased when theories describe

715   intentional harm, and target the believer themselves. Network analysis partially replicated

716   these results, for example indicating that belief in self-referential conspiracy theories

717   describing intentional harm is more closely associated with paranoia than belief in these

718   conspiracy theories when they describe harm that targets society as a whole. Participants

719   were more likely to endorse conspiracy-type beliefs that they thought would be supported by

720   their ingroup members, and this effect increased with paranoia. As such, our results speak to

721   a number of unanswered questions on how paranoia relates to the components of

722   conspiracy thinking; as well as how the features of conspiracy theories relate to how

723   believable they are overall.

724   **References**

725   Abrams, D., & Hogg, M. A. (1990). *Social identity theory: Constructive and critical advances*.

726   Springer-Verlag Publishing.

727   Barnby, J. M., Deeley, Q., Robinson, O., Raihani, N., Bell, V., & Mehta, M. A. (2020).

728   Paranoia, sensitization and social inference: Findings from two large-scale, multi-round

729   behavioural experiments. *Royal Society Open Science*, *7*(3).

730   https://doi.org/10.1098/rsos.191525

731   Bebbington, P. E., McBride, O., Steel, C., Kuipers, E., Radovanovič, M., Brugha, T., Jenkins,

732   R., Meltzer, H. I., & Freeman, D. (2013). The structure of paranoia in the general

733   population. *British Journal of Psychiatry*, *202*(6), 419–427.

734   https://doi.org/10.1192/bjp.bp.112.119032

735   Bell, V., Raihani, N., & Wilkinson, S. (2021). Derationalizing Delusions. *Clinical

736   Psychological Science*, *9*(1), 24–37. https://doi.org/10.1177/2167702620951553

737   Brotherton, R., French, C. C., & Pickering, A. D. (2013). Measuring belief in conspiracy

738   theories: The generic conspiracist beliefs scale. *Frontiers in Psychology*.

739   https://doi.org/10.3389/fpsyg.2013.00279

740   Bruder, M., Haffke, P., Neave, N., Nouripanah, N., & Imhoff, R. (2013). Measuring Individual

741   Differences in Generic Beliefs in Conspiracy Theories Across Cultures: Conspiracy

742   Mentality Questionnaire. *Frontiers in Psychology*.

743   https://doi.org/10.3389/fpsyg.2013.00225

744   Burnham, K. P., & Anderson, D. R. (2002). A practical information-theoretic approach. In

745   *Model selection and multimodel inference 2*.

746   Christensen, R. H. B. (2018). Cumulative Link Models for Ordinal Regression with the R

747   Package ordinal. *Christensen Statistics*, *Christensen 2018*, 1–40.

748   Cikara, M. (2021). Causes and Consequences of Coalitional Cognition. In *Advances in

749   Experimental Social Psychology*.

750   Douglas, K. M., Sutton, R. M., Callan, M. J., Dawtry, R. J., & Harvey, A. J. (2016). Someone

751   is pulling the strings: hypersensitive agency detection and belief in conspiracy theories.

752   *Thinking and Reasoning*, *22*(1), 57–77.

753   https://doi.org/10.1080/13546783.2015.1051586

754   Douglas, K. M., Sutton, R. M., & Cichocka, A. (2017). The psychology of conspiracy

755   theories. *Current Directions in Psychological Science*, *26*(6), 538–542.

756   https://doi.org/10.4324/9781315525419

757   Douglas, K. M., Uscinski, J. E., Sutton, R. M., Cichocka, A., Nefes, T., Ang, C. S., & Deravi,

758   F. (2019). Understanding Conspiracy Theories. *Political Psychology*, *40*(S1), 3–35.

759   https://doi.org/10.1111/pops.12568

760   Epskamp, S., Borsboom, D., & Fried, E. I. (2018). Estimating psychological networks and

761   their accuracy: A tutorial paper. *Behavior Research Methods*, *50*(1), 195–212.

762   https://doi.org/10.3758/s13428-017-0862-1

763 Epskamp, S., Cramer, A., Waldorp, L., Schmittmann, V., & Borsboom, D. (2012). qgraph:

764   Network Visualizations of Relationships in Psychometric Data. *Journal of Statistical*

765   *Software*, *48*(4), 1–18. https://doi.org/http://dx.doi.org/10.18637/jss.v048.i04

766 Epskamp, S., & Fried, E. I. (2018). A tutorial on regularized partial correlation networks.

767   *Psychological Methods*, *23*(4), 617–634. https://doi.org/10.1037/met0000167

768 Everett, J. A. C. (2013). The 12 Item Social and Economic Conservatism Scale (SECS).

769   *PLoS ONE*, *8*(12). https://doi.org/10.1371/journal.pone.0082131

770 Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power

771   analysis program for the social, behavioral, and biomedical sciences. *Behavior research*

772   *methods*, *39*(2), 175-191.

773 Foygel, R., & Drton, M. (2010). Extended Bayesian information criteria for Gaussian

774   graphical models. *Advances in Neural Information Processing Systems*, *23*, 604–6129.

775 Freeman, D., & Bentall, R. P. (2017). The concomitants of conspiracy concerns. *Social*

776   *Psychiatry and Psychiatric Epidemiology*, *52*(5), 595–604.

777   https://doi.org/10.1007/s00127-017-1354-4

778 Freeman, D., Loe, B. S., Kingdon, D., Startup, H., Molodynski, A., Rosebrock, L., Brown, P.,

779   Sheaves, B., Waite, F., & Bird, J. C. (2021). The revised Green et al., Paranoid

780   Thoughts Scale (R-GPTS): Psychometric properties, severity ranges, and clinical cut-

781   offs. *Psychological Medicine*, *51*(2), 244–253.

782   https://doi.org/10.1017/S0033291719003155

783 Fried, E. I., & Cramer, A. O. J. (2017). Moving Forward: Challenges and Directions for

784   Psychopathological Network Theory and Methodology. *Perspectives on Psychological*

785   *Science*, *12*(6), 999–1020. https://doi.org/10.1177/1745691617705892

786 Gelman, A. (2008). Scaling regression inputs by dividing by two standard deviations.

787   *Statistics in Medicine*, *27*(1), 2865–2873. https://doi.org/10.1002/sim

788 Georgiou, N., Delfabbro, P., & Balzan, R. (2021). Autistic traits as a potential confounding

789   factor in the relationship between schizotypy and conspiracy beliefs. *Cognitive*

790   *Neuropsychiatry*, 1-20.

791 Green, C. E. L., Freeman, D., Kuipers, E., Bebbington, P., Fowler, D., Dunn, G., & Garety, P.

792   A. (2008). Measuring ideas of persecution and social reference: The Green et al.

793   Paranoid Thought Scales (GPTS). *Psychological Medicine*, *38*(1), 101–111.

794   https://doi.org/10.1017/S0033291707001638

795 Greenaway, K. H., Haslam, S. A., & Bingley, W. (2018). Are "they" out to get me? A social

796   identity model of paranoia. *Group Processes & Intergroup Relations*,

797   136843021879319. https://doi.org/10.1177/1368430218793190

798   Greenburgh, A., Bell, V., & Raihani, N. (2019). Paranoia and conspiracy: Group cohesion

799   increases harmful intent attribution in the Trust Game. *PeerJ*, *2019*(8), 1–16.

800   https://doi.org/10.7717/peerj.7403

801   Grueber, C. E., Nakagawa, S., Laws, R. J., & Jamieson, I. G. (2011). Multimodel inference in

802   ecology and evolution: Challenges and solutions. *Journal of Evolutionary Biology*,

803   *24*(4), 699–711. https://doi.org/10.1111/j.1420-9101.2010.02210.x

804   Grzesiak-Feldman, M. (2015). Are the high authoritarians more prone to adopt conspiracy

805   theories. In *The psychology of conspiracy* (pp. 99–117).

806   Haslbeck, J. M. B., & Waldorp, L. J. (2018). How well do network models predict

807   observations? On the importance of predictability in network models. *Behavior*

808   *Research Methods*, *50*(2), 853–861. https://doi.org/10.3758/s13428-017-0910-x

809   Haslbeck, J. M. B., & Waldorp, L. J. (2019). mgm: Estimating Time-Varying Mixed Graphical

810   Models in High-Dimensional Data. *Journal of Statistical Software*, *VV*(Ii).

811   http://arxiv.org/abs/1510.06871

812   Imhoff, R., & Bruder, M. (2014). Speaking (Un-)truth to power: Conspiracy mentality as a

813   generalised political attitude. *European Journal of Personality*, *28*(1), 25–43.

814   https://doi.org/10.1002/per.1930

815   Imhoff, R., & Lamberty, P. (2018). How paranoid are conspiracy believers? Toward a more

816   fine-grained understanding of the connect and disconnect between paranoia and belief

817   in conspiracy theories. *European Journal of Social Psychology*.

818   https://doi.org/10.1002/ejsp.2494

819   Lantian, A., Muller, D., Nurra, C., & Douglas, K. M. (2017). "I know things they don't know!"

820   the role of need for uniqueness in belief in conspiracy theories. *Social Psychology*.

821   https://doi.org/10.1027/1864-9335/a000306

822   Martin, J. A., & Penn, D. L. (2001). Brief report Social cognition and subclinical paranoid

823   ideation A number of social-cognitiv e and clinical constructs have been implicated in

824   paranoid. *British Journal of Clinical Psychology*, *40*, 261–265.

825   http://www.brown.uk.com/schizophrenia/martin.pdf

826   McCabe, R., Leudar, I., & Antaki, C. (2004). Do people with schizophrenia display theory of

827   mind deficits in clinical interactions?. *Psychological Medicine*, *34*(3), 401-412.

828   McIntyre, J. C., Elahi, A., & Bentall, R. P. (2016). Social identity and psychosis: Explaining

829   elevated rates of psychosis in migrant populations. *Social and Personality Psychology*

830   *Compass*, *10*(11), 619–633. https://doi.org/10.1111/spc3.12273

831   McIntyre, J. C., Wickham, S., Barr, B., & Bentall, R. P. (2018). Social Identity and Psychosis:

832   Associations and Psychological Mechanisms. *Schizophrenia Bulletin*.

833   https://doi.org/10.1093/schbul/sbx110

834   Petty, R. E., Cacioppo, J. T., & Goldman, R. (1981). Personal involvement as a determinant

835   of argument-based persuasion. *Journal of Personality and Social Psychology*, *41*(5),

836   847–855. https://doi.org/10.1037//0022-3514.41.5.847

837   Phadke, S., Samory, M., & Mitra, T. (2020). What makes people join conspiracy

838   communities?: role of social factors in Conspiracy Engagement. *ArXiv*, *4*(December).

839   Raihani, N. J., & Bell, V. (2017). Paranoia and the social representation of others: A large-

840   scale game theory approach. *Scientific Reports*, *7*(1), 1–9.

841   https://doi.org/10.1038/s41598-017-04805-3

842   Raihani, N. J., & Bell, V. (2019). An evolutionary perspective on paranoia. *Nature Human*

843   *Behaviour*, *3*(2), 114–121. https://doi.org/10.1038/s41562-018-0495-0

844   Saalfeld, V., Ramadan, Z., Bell, V., & Raihani, N. J. (2018). Experimentally induced social

845   threat increases paranoid thinking Subject Category : Subject Areas : *Royal Society*

846   *Open Science*. https://doi.org/10.1098/rsos.180569

847   So, S. H. wai, Sun, X., Chan, G. H. K., Chan, I. H. H., Chiu, C. De, Chan, S. K. W., Wong,

848   W. Y. E., Leung, P. W. leung, & Chen, E. Y. H. (2020). Risk perception in paranoia and

849   anxiety: Two investigations across clinical and non-clinical populations. *Schizophrenia*

850   *Research: Cognition*. https://doi.org/10.1016/j.scog.2020.100176

851   Suthaharan, P., Reed, E.J., Leptourgos, P. *et al.* (2021). Paranoia and belief updating during

852   the COVID-19 crisis. *Nature Human Behaviour, 1-13.* https://doi.org/10.1038/s41562-

853   021-01176-8

854   Uscinski, J. E., Parent, J. M., & Torres, B. (2011). "Conspiracy theories are for losers."

855   *American Political Science Association Annual Conference.*

856   van der Linden, S., Panagopoulos, C., Azevedo, F., & Jost, J. T. (2021). The Paranoid Style

857   in American Politics Revisited: An Ideological Asymmetry in Conspiratorial Thinking.

858   *Political Psychology*, *42*(1), 23–51. https://doi.org/10.1111/pops.12681

859   Van Elk, M. (2015). Perceptual biases in relation to paranormal and conspiracy beliefs. *PLoS*

860   *ONE*, *10*(6), 1–15. https://doi.org/10.1371/journal.pone.0130422

861   van Prooijen, J.-W., & Douglas, K. M. (2018). Belief in Conspiracy Theories: Basic Principles

862   of an Emerging Research Domain. *European Journal of Social Psychology*.

863   https://doi.org/10.1002/ejsp.2530

864   van Prooijen, J. W., & Douglas, K. M. (2017). Conspiracy theories as part of history: The role

865   of societal crisis situations. *Memory Studies*, *10*(3), 323–333.

866   https://doi.org/10.1177/1750698017701615

867   van Prooijen, J. W., Douglas, K. M., & De Inocencio, C. (2018). Connecting the dots: Illusory

868   pattern perception predicts belief in conspiracies and the supernatural. *European*

869   *Journal of Social Psychology*, *48*(3), 320–335. https://doi.org/10.1002/ejsp.2331

870   van Prooijen, J. W., Krouwel, A. P. M., & Pollet, T. V. (2015). Political Extremism Predicts

871   Belief in Conspiracy Theories. *Social Psychological and Personality Science*, *6*(5), 570–

578. https://doi.org/10.1177/1948550614567356

Williams, D. (2020). Socially adaptive belief. *Mind & Language*, mila.12294. https://doi.org/10.1111/mila.12294

Wood, M. J., Douglas, K. M., & Sutton, R. M. (2012). Dead and alive: Beliefs in contradictory conspiracy theories. *Social Psychological and Personality Science*, *3*(6), 767–773. https://doi.org/10.1177/1948550611434786

Yousif, S. R., Aboody, R., & Keil, F. C. (2019). The Illusion of Consensus: A Failure to Distinguish Between True and False Consensus. *Psychological Science*, *30*(8), 1195–1204. https://doi.org/10.1177/0956797619856844