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Actively open-minded thinking and liberal ideology: associations and dissociations

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ABSTRACT

The thinking disposition of actively open-minded thinking (AOT) has long been known to correlate with liberal ideology. In this study, we demonstrate that AOT is not just a proxy for a liberal worldview. We find that it is AOT—and not liberal ideology—that is more optimally associated with adaptive epistemic attitudes. In a study of 682 subjects, we found that AOT and liberal ideology moderately correlated but, nonetheless, AOT dissociated from liberalism in several respects. Political liberalism was positively associated with several aspects of left-wing authoritarianism, but AOT scores were significantly negatively correlated. Variables associated with non-adaptive psychological states and beliefs (e.g., belief in the paranormal, the Dark Triad, paranoia) were negatively correlated with AOT scores, but uncorrelated with liberal ideology. Political liberalism was positively correlated with the ability to discriminate between mature conspiratorial beliefs that actually occurred and those which did not, but AOT scores displayed a significantly higher correlation. AOT seems to associate exclusively with the parts of political liberalism that lead to positive epistemic consequences and to dissociate from any aspects of liberal ideology that lead to unwarranted belief and non-adaptive action.

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KEYWORDS Actively open-minded thinking; thinking dispositions; ideology; epistemic attitudes; contested knowledge

Many important thinking dispositions and cognitive styles, such as need for cognition and need for closure, have been identified and studied empirically in psychological research (Cacioppo et al., 1996; Webster & Kruglanski, 1994). Recently, there has been rising interest in actively open-minded thinking (AOT) as a thinking disposition/cognitive style that is associated with numerous measures of rationality, including many aspects

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of rational belief and rational action that have practical importance (Metz, 2023; Metz et al., 2020; Pennycook et al., 2020; Stanovich & Toplak, 2023). For example, AOT has been found to correlate with the avoidance of paranormal and supernatural beliefs (Erceg et al. 2022; Pennycook et al. 2020; Rizeq et al. 2021; Svedholm & Lindeman, 2013); sceptical processing of fake news and misinformation (Bronstein et al., 2019; Hubeny et al., 2025; Roozenbeek et al., 2022); resistance to conspiracy beliefs (Bowes et al., 2023; Jastrzębski & Chuderski 2022; Pennycook et al. 2020; Stanovich et al., 2016); optimal information acquisition (Haran et al., 2013); accuracy in future forecasting (Mellers et al., 2015); belief in evolution (Deniz et al., 2008; Sinatra et al., 2003); utilitarian decision making (Baron et al., 2015); sceptical attitudes towards alternative medicine (Svedholm-Häkkinen & Lindeman, 2018); optimal attitudes towards savings and gambling (Toplak et al., 2017); the ability to evaluate arguments (Stanovich & West, 1997); and cognitive inhibition skills (Campitelli & Gerrans, 2014).

The scores on AOT scales are also very potent predictors of the ability to perform well on many of the heuristics and biases tasks that index aspects of rational thinking. This pattern of results has been found in a variety of studies conducted in many labs and has been obtained across a plethora of heuristics and biases tasks, including: noncausal base-rate tasks, hypothesis evaluation tasks, four-card selection tasks, covariation detection, the gambler's fallacy, conjunction fallacy, Bayesian reasoning, framing problems, ratio bias, sample size problems, and probability matching (Erceg et al. 2022; Jastrzębski & Chuderski 2022; Pennycook et al. 2014; Toplak et al. 2011, 2014a, 2014b, 2017; Viator et al. 2020; West et al. 2008). The association between AOT and performance on these tasks often remains even when cognitive ability has been partialled out (Stanovich et al., 2016).

The measurement of AOT has been refined over the years. Baron (1985, 1988, 1993) first named and discussed AOT as an important thinking disposition, and Stanovich and West (1997) produced the first AOT scale that was used widely. In that scale, AOT was conceptualised as a thinking disposition encompassing the cultivation of reflectiveness rather than impulsivity; the desire to act for good reasons; tolerance for ambiguity combined with a willingness to postpone closure; and the seeking and processing of information that disconfirms one's beliefs. The items on that initial version tapped reasoning styles such as the willingness to consider evidence contradictory to beliefs with items such as "People should always take into consideration evidence that goes against their beliefs"; the willingness to consider alternative opinions and explanations ("A person should always consider new possibilities"); and the willingness to postpone closure ("There is nothing wrong with being undecided about many issues"). The scale was a marker for the avoidance of epistemological absolutism; willingness to perspective-switch; and the tendency to consider alternative opinions and evidence. Revisions in AOT scales continued throughout the next two decades. By 2007, the scale had ballooned to 41 items (Stanovich & West 2007), later shortened to 30 items in the Comprehensive Assessment

of Rational Thinking (Stanovich et al. 2016), and to 13 items by Stanovich and Toplak (2023), which is the scale we employ here. The content of this scale is more conceptually coherent than previous AOT scales (see Stanovich & Toplak, 2023) as is the 6-item scale of Newton et al. (2024) that uses similar items.[1]

One recurring complicating factor in interpreting relationships involving AOT is that it has consistently shown robust relationships with political ideology and ideology-related variables such as religiosity and party affiliation (Baron et al., 2015; Bonafé-Pontes et al., 2025; Pennycook et al., 2020; Piazza & Landy, 2013; Stanovich & Toplak, 2019; Yılmaz & Sarıbay, 2017). Liberal respondents and those with left-wing political affiliations score higher on AOT scales, as do those lower in religiosity. Both Stanovich and Toplak (2019) and Pennycook et al. (2020) have demonstrated that correlations with ideology and religiosity can be inflated by items using the word "belief" in AOT items. Nonetheless, a relationship between liberalism/left-wing ideology and AOT scores in the range of 0.20–0.40 remains even when scales are edited to remove the word belief (see Stanovich & Toplak, 2019, for a discussion of this effect). This moderate and replicable relationship raises the question of whether AOT scales are more accurately interpreted as indicating a political attitude or worldview rather than an information processing disposition. In short, we might inquire into the extent to which AOT is an information processing propensity and the extent to which it is merely a political attitude indicating liberalism.

In the present study, we examine the issue of whether the AOT is more than just a proxy for a political ideology. For example, it is of course well-known that ideological liberalism is negatively correlated with right-wing authoritarianism (RWA; Altemeyer, 1981, 1996; Bizumic & Duckitt, 2018); however, ideological liberalism is *positively* correlated with left-wing authoritarianism (LWA; Conway et al., 2018; Costello et al., 2022). Because AOT correlates with ideological liberalism, it thus becomes important to know whether AOT is likewise positively correlated with LWA. Because authoritarianism is the antithesis of open-minded thinking, such a positive correlation would undermine AOT's status as a meaningful psychological construct. It would mean that AOT was simply a proxy for the political attitude of liberalism. In contrast, should AOT dissociate from liberalism in the case of LWA (that is, correlate negatively with LWA, or even fail to correlate), it would bolster AOT's status as an important epistemic disposition and refute the notion that it is merely a proxy for a particular political attitude.

[1]The 6 items in the Newton et al. (2024) scale were all what we term belief revision items (see Stanovich & Toplak, 2023) and were highly similar to several items in the 13-item scale employed here. The present scale contained 9 items that stressed either belief revision or overconfidence about knowledge claims. The remaining 4 items were more focused on being reflective or having reasons for actions.

The present study employs a similar logic with regard to a variety of psychological attitudes that have been shown to be associated with negative outcomes: paranormal thinking (Bensley et al., 2020, 2022; Dagnall et al., 2025; Lobato et al., 2014; Šrol, 2022; Ståhl & van Prooijen, 2018); the Dark Triad (Furnham et al., 2013); and paranoia (Bowes et al., 2023; Imhoff & Lamberty, 2018). We also examine political attitudes with epistemic consequences—that is, attitudes that can result in overly sceptical epistemic stances, such as anti-establishment attitudes (Enders & Uscinski, 2021) and belief in hidden causal forces (Oliver & Wood, 2014), and attitudes that can result in overly *credulous* epistemic stances, such as the tendency to uncritically accept government claims (Stanovich & Toplak, 2025b). Additionally, because Costello et al. (2022) have linked various political attitudes to partisan intolerance and the endorsement of political violence, we included a measure of anti-democratic tendencies and a measure of the endorsement of political violence in the study.

We also examined a consequence of epistemic attitudes: belief in so-called "legacy" or "mature" false conspiracies (Keeley, 1999). Mature false conspiracy beliefs are conspiracies that have been posited and investigated over a considerable period of time. The length of time such conspiracies have been investigated without positive conformation of their actual existence becomes evidence that such beliefs are ill-founded (Dentith, 2022; Keeley, 1999). Mature conspiracy beliefs are differentiated from newly appearing conspiracy beliefs that are in more of an epistemic limbo, due to the fact that conspiracies do happen (Pigden, 1995, 2024). Thus, specific *contemporary* conspiracy beliefs are not inevitably false and are in a broad class of beliefs that we term contested beliefs or contested knowledge, a class that we also examine in the study.

Information may be contested in many ways. There may be disputes within knowledge elites (experts) themselves. There may be disputes within the public. And then there may be disputes between the public and segments of the expert class. Thus, what we call contested knowledge claims represent a large and varied class of propositions. Evidence on either side of the proposition need not be equal. Some of the propositions we test have more converging evidence on one side than the other. The term contested proposition is not tied to the state of the evidence. We use it in the relativistic sense meaning only that some proportion of the population is committed to one side of the proposition and some proportion of the population is committed to the other. Propositions often become contested for partisan reasons. For example, we studied some contested information claims that, on one side of the partisan divide are considered "facts," and on the other side of the partisan divide are thought to be "misinformation". Our focus is on contested propositions that are affirmed by respondents of liberal ideology more than those of conservative ideology, because the purpose of the study was to see under what conditions (if any) AOT *dissociates* from liberal ideology.

Method

Participants

Participants were recruited using the online platform Prolific, a crowd-sourcing platform that provides participants for psychological research (Peer et al., 2017). Filters placed on Prolific included a minimum age of 18, US nationality, English as participants' first language, an approval rate of 95–100, and a minimum of 100 previous submissions. Responses were accepted from mobile, tablet, and desktop devices.

Five of the 696 subjects who attempted the survey did not complete it and 9 subjects took less than 9 min to complete the questionnaires, which was deemed not long enough for accurate responses, so they were removed. No subject in the remaining sample of 682 failed two or three attention checks, but 21 of the 682 subjects did fail one. We decided to utilise all 682 subjects in the sample (264 male, 406 female, 9 indicating other, and 3 preferring not to answer). The median age of the total sample was 39 years and the mean was 40.5 years (SD = 12.5). The sample was 65.4% White, 19.1% Black, 6.6% Hispanic, 5.1% Asian, and 3.8% other. Informed consent was obtained for experimentation with human subjects and data privacy maintained according to IRB guidelines of the second author's institution.

Procedure

The experiment was run online using Qualtrics. Subjects received monetary compensation for their participation and the median time taken to complete the battery of tasks was 22 min. A short demographics questionnaire was administered first, followed by all of the remaining tasks and scales with their items randomly intermixed. For each item, subjects responded on a six-point scale with no neutral point: strongly disagree (1), disagree (2), slightly disagree (3), slightly agree (4), agree (5), strongly agree (6).

Measures

Political affiliation and religiosity

The demographics questionnaire filled out by each subject contained two items measuring political ideology. The first was "*Economically*, I would consider myself to be" and was answered on a six-point scale ranging from very conservative (scored 1) to very liberal (scored 6). The second was "*Socially*, I would consider myself to be" and was answered on a six-point scale ranging from very conservative (scored 1) to very liberal (scored 6). 55.6% of the sample indicated some degree of economic liberalism, and 65.8% of the sample indicated some degree of social liberalism. The two items displayed a correlation of 0.75. The responses on these two questions were standardised and summed to yield a composite ideology

score. Higher scores corresponded to greater liberalism. The experiment was run in October of 2024 and subjects were asked who they would vote for in the upcoming presidential election: 203 indicated Donald Trump, 409 indicated Kamala Harris, and 69 indicated they were voting for a third-party candidate (one did not indicate a choice). Subjects indicated their party affiliation on a seven-point scale ranging from strongly Republican to strongly Democrat, with Independent in the middle. Collapsing across the degrees of affiliation, 21.6% indicated that they were Republicans, 49.6% indicated that they were Democrats, and 28.9% indicated that they were Independents.

The demographics questionnaire filled out by each subject contained two items measuring religiosity. The first was "Religion is important in my everyday life" and it was answered on a six-point scale ranging from disagree strongly (scored as 1) to agree strongly (scored as 6). The second question was "My feelings concerning the existence of God are" and was answered on a seven-point scale ranging from "I am certain that God does not exist" (scored as 1) to "I am certain that God exists" (scored as 7). The two items displayed a correlation of 0.75. The responses on these two questions were standardised and summed to yield the religiosity score.

Actively open-minded thinking (AOT)

The AOT scale that was used has a long history and has undergone many revisions (Stanovich & West, 1997, 2007). Stanovich and Toplak (2023) discuss the entire 25-year history of the scale and the rationale for the 13-item scale used here (see the Supplementary Materials for the wording of each item and for the mean response on each item). Importantly, none of the items in the 13-item version employ the word "belief" which has been found to lead to biased estimates of correlations, especially in studies on politicised topics (see Stanovich & Toplak, 2019).

Some items on the current version tap the disposition towards reflectivity using items like: "Intuition is the best guide in making decisions" (reverse scored). Other items assess the tendency towards epistemic overconfidence (e.g., "Considering too many different opinions often leads to muddled thinking", reverse scored). However, the majority of the items assessed the tendency to revise opinions in the face of new evidence (e.g., "One should disregard evidence that conflicts with your current opinions" reverse scored). Conceptually, the scale focuses strongly on issues of epistemic self-regulation (Samuelson & Church, 2015). It was originally conceived as a marker for the avoidance of epistemological absolutism; willingness to perspective-switch; and the tendency to consider alternative opinions and evidence. The mean total score on the 13 AOT items was 59.7 (SD = 7.7). This represents an average score of 4.59, which is a response scale location midway between slightly agree and agree. The reliability of the scale was 0.81 (Cronbach's alpha).

Paranormal Beliefs

The Paranormal Beliefs scale consisted of 12 items (see the Supplementary Materials for the wording of each item and for the mean response on each item). The scale covers a wide range of purported paranormal phenomena: spirits, predicting the future, ESP, Tarot cards, police psychics, karma, mediums, psychokinesis, and more. Two items were taken from Tobacyk (2004); two items were taken (and rewritten) from the Superstitious Thinking subtest of the CART; two items were taken from Irwin and Marks (2013). Six items were new to this scale; example items: "I believe in reincarnation—that a person may have lived before in another body," "Homes can be haunted by spirits or ghosts." The mean total score on the 12 paranormal belief items was 34.0 (SD = 14.0). This represents an average score of 2.43, which is a response scale location midway between slightly disagree and disagree. The reliability of the scale was high (Cronbach's alpha = 0.94).

Dark Triad: Machiavellianism, Psychopathy, Narcissism

The Machiavellianism scale consisted of the four items used by Uscinski et al. (2022). The Psychopathy scale consisted of the four items used by Uscinski et al. (2022). The Narcissism scale consisted of nine items, the four items used by Uscinski et al. (2022) and five items chosen from the narcissistic grandiosity scale used by Rosenthal et al. (2020). See the Supplementary Materials for the wording of each item and for the mean response on each item. The reliability of the three scales (Cronbach's alpha), was 0.79, 0.64, and 0.86, respectively.

Paranoia

The Paranoia scale consisted of the three items used by Green et al. (2008) and Klofstad et al. (2025), for example "Certain people have it in for me". See the Supplementary Materials for the wording of each item and for the mean response on each item. The reliability of the three items (Cronbach's alpha), was 0.75.

Anti-Establishment Attitudes (AEA) Scale

The AEA scale consisted of six items. Two of the items came from the populism scale used by Enders, Diekman et al. (2023) and were rewritten; one item came from the anti-elitism dimension of a scale used by Oliver and Rahn (2016); one item from the populist attitudes scale of Schulz et al. (2018) was slightly rewritten; one item from the populism dimension of the scale studied by Akkerman et al. (2014); and one item from the populist index of Stavrakakis et al. (2017) was rewritten. See the Supplementary Materials for the wording of each item and for the mean response on each item. A typical item on the scale is: "Policies that are popular with the people are often ignored in favor of what benefits the

establishment." The mean total score on the six AEA items was 26.7 (SD = 4.7). This represents an average score of 4.45, which is a response scale location midway between slightly agree and agree. The reliability of the AEA scale was 0.73 (Cronbach's alpha).

Hidden Causal Forces Scale (HCFS)

The HCFS consisted of 8 items drawn from several sources in the literature (see the Supplementary Materials for the wording of each item and for the mean response on each item). We intended this scale to assess a person's generic prior regarding hidden forces/unknown causes (Stanovich & Toplak, 2025b). We examined several conspiracy ideation/mentality scales (Imhoff & Bruder, 2014; Stojanov & Halberstadt, 2019; Uscinski et al., 2022; Wood, 2017) and chose 8 items that stressed forces hidden from the public and opaque causes without referring to much specific content (e.g., "There are many very important things happening in the world about which the public is not informed"). The mean total score on the 8 HCFS items was 33.4 (SD = 7.6). This represents an average score of 4.18, which is a response scale location close to slightly agree. The reliability of the scale was high (Cronbach's alpha = 0.88).

Government Credulity Scale

The AEA and HCFS emphasise scepticism towards political elites. Recently, more theorists have been emphasising that it is not only scepticism that can be excessive, but that a person can be overly credulous about elites and government entities (Hagen, 2018; Räikkä & Basham, 2019; Shermer, 2022). They point out that governments at all levels, as well as corporations, engage in undisclosed planning for outcomes that might not be popular with the public. Thus, to balance the AEA's (and the HCFS's) focus on scepticism towards elites, we constructed the Government Credulity scale designed to tap the tendency to be overly trusting of government entities (sample item: "Governments don't overspend because experts make sure inflows and outflows balance"). The scale had nine items (see the Supplementary Materials for the wording of each item and for the mean response on each item). The mean total score on the nine Government Credulity items was 26.9 (SD = 6.6). This represents an average score of 2.99, which is a response scale location just below slightly disagree. The reliability of the Government Credulity scale was 0.74 (Cronbach's alpha).

Right-Wing Authoritarianism (RWA)

The RWA scale consisted of 9 items: six items from the Very Short Authoritarianism scale (Bizumic & Duckitt, 2018) as well as three items from the short form compiled by Duckitt et al. (2010). Each of the items taken from Duckitt et al. (2010) was from a different facet (see the Supplementary Materials for the wording of each item and for the mean

response on each item). The mean total score on the RWA was 27.8 (SD = 9.0). This represents an average score of 3.09, which is a response scale location close to slightly disagree. The reliability of the scale was 0.84 (Cronbach's alpha).

Left-Wing Authoritarianism (LWA)

The LWA scale we employed consisted of 9 items selected from the scale developed by Costello et al. (2022). Four items were drawn from their anti-hierarchical aggression facet (e.g., "Constitutions and laws are just another way for the powerful to destroy our dignity and individuality") and five items were drawn from their top-down censorship facet (e.g., "We must line up behind strong leaders who have the will to stamp out prejudice and intolerance"). The anti-conventionalism facet was not sampled. The Supplementary Materials contains the wording of each item and the mean response on each item. The mean total score on the LWA was 30.7 (SD = 7.7). This represents an average score of 3.41, which is a response scale location close to middle. The reliability of the scale was 0.77 (Cronbach's alpha).

Mature Conspiracy Beliefs

Five mature false conspiracy beliefs[2] were chosen from the 24 false conspiracy items from the Conspiracy Beliefs subtest of the CART (Stanovich et al., 2016). All represented what Keeley (1999) termed as mature conspiracy theories that, because of the longevity property (and other features), were highly implausible. All have been extensively studied in the literature and involved: the assassination of Martin Luther King Jr., the 9/11 attacks, Federal Reserve conspiracies, the dangers of genetically-modified foods, and pharmaceutical industry plots (see the Supplementary Materials for the wording of each conspiracy and for the mean response on each item). The mean total score on the 5 false conspiracy items was 17.2 (SD = 5.9). This represents an average score of 3.44, which is a response scale location close to middle. The reliability of the scale was 0.81 (Cronbach's alpha).

Five mature true conspiracy beliefs were chosen from two sources in the literature (see the Supplementary Materials for the wording of each conspiracy and for the mean response on each item). Four items were chosen from Bensley and Lilienfeld (2019) and one item was chosen from Wood (2016). Small edits were made in several items. All have been extensively studied in the literature and involved: the CIA conducting

[2]We could have followed Keeley (1999) and used the terms warranted and unwarranted, rather than true and false. The latter choice was for convenience and readability only, and no strong philosophical stance was intended.

experiments on citizens without their consent, NSA secretly collecting phone records, IRS harassment based on political opinions, the U. S. government hiring scientists from Nazi Germany, and the U.S. government intentionally exposing its own troops to radiation. The mean total score on the 5 true conspiracy items was 19.7 (SD = 5.1). This represents an average score of 3.94, which is a response scale location close to slightly agree. The reliability of the scale was 0.75 (Cronbach's alpha).

We also conducted a signal detection analysis of the ability to discriminate between true and false conspiracy beliefs. After converting the item responses on the scales from our six-point scale into a 1/0 (believe/not believe) scoring scheme, our analysis followed the steps described by Batailler et al. (2022) in order to calculate a d' discrimination index for each subject.

Political Violence and Anti-Democratic Attitudes Scales

The Political Violence scale had a total of five items, four taken from, inspired by, or rewritten from Costello et al. (2022) and Uscinski et al. (2021), and one item ("If needed to reach important objectives, the use of violence is acceptable") taken from Klofstad et al. (2025). The Anti-Democratic Attitudes scale was comprised of six items (e.g., "People who are caught spreading misinformation on the internet should not be able to vote"). See the Supplementary Materials for the wording of each item and for the mean response on each item on both scales. The mean total score on the Political Violence scale was 10.3 (SD = 4.9). This represents an average score of 2.06, which is a response scale location close to disagree. The mean total score on the Anti-Democratic Attitudes scale was 19.1 (SD = 6.1). This represents an average score of 3.18, which is a response scale location close to slightly disagree. The reliability of the Political Violence scale was 0.85 (Cronbach's alpha) and the reliability of the Anti-Democratic Attitudes scale was 0.80 (Cronbach's alpha).

Currently Contested Beliefs, Facts, and Propositions

This set of propositions was a selection of statements, purported facts, and contemporary conspiracy beliefs that were not intended to be a coherent category in any way. See the Supplementary Materials for the wording of each item and for the mean response on each item. Many of the contested knowledge claims we examined have truly indeterminate conclusions, and others are more dubious given current knowledge and the common interpretation of the words and terms used in them. Overall, they were tilted towards the implausible.

Political scientists have long known that facts can be made either more difficult or easier to discern if they are politicised (Klein, 2011; Klein & Buturovic, 2011; Lupia, 2016). Thus, even factual propositions can easily be chosen in a manner so as to make them more difficult for one partisan side or the other (Berinsky, 2023; Lupia, 2016). This is what makes the

assessment of civic knowledge and political misperceptions so difficult (Bullock & Lenz, 2019; Graham, 2023; Kuklinski & Quirk, 2001). Because the positive correlation between AOT and liberalism has long been empirically established, in order to more easily examine possible convergences and disassociations between the two in their predictive relationships, we chose contested propositions likely to be endorsed by liberals. By looking at some of the more dubious contested claims, we can examine whether high AOT helps people overcome ideology-based biases.[3] By using a set of contested claims, we were able to see whether AOT and ideology could become dissociated in the epistemic domain. Each item will be treated separately in the results and no scale was formed. The mean scores across the nine items ranged from 2.30 to 3.83 (see Supplementary Materials) and the average score was 2.92 (close to slightly disagree on the scale).

Results

The relationships between performance on the AOT and the ideological variables are presented in Table 1 (a full correlation matrix containing all of the variables in the study is presented in the Supplementary Materials). The table indicates that there was a positive 0.356 correlation between the ideology composite variable and the score on the AOT scale, indicating that liberals tended to score higher on the AOT than did conservatives. The magnitude of the relationship is consistent with past research showing that it is usually in the range of 0.20 to 0.40 with versions of the AOT that do not employ the problematic belief language

Table 1. Correlations between AOT and the ideological variables.

	1	2	3	4	5	6
1. AOT						
2. Ideology – economics	0.294					
3. Ideology – social	0.372	0.750				
4. Ideology – composite	0.356	0.936	0.936			
5. Party	0.269	0.703	0.733	0.768		
6. RWA	−0.474	−0.494	−0.618	−0.594	−0.478	
7. LWA	−0.195	0.304	0.288	0.316	0.296	−0.074

Note: All of the ideology variables are coded in the direction that higher scores represent liberalism and lower scores represent conservative attitudes; all correlations larger than or equal to 0.076 in absolute value are significant at the 0.05 level, and correlations larger than or equal to 0.126 in absolute value are significant at the 0.001 level.

AOT = Actively Open-Minded Thinking scale; RWA = Right-Wing Authoritarianism; LWA = Left-Wing Authoritarianism.

[3]The use of highly contested liberal propositions is more diagnostic than the use of items alluring to conservatives because, in the liberal case, just one aspect of AOT (the tendency for those high in AOT to be sceptical of unproven propositions) leads to disagreement with the proposition; whereas highly contested conservative propositions might be resisted by those high in AOT because of accuracy considerations, but also because of ideological considerations.

(Stanovich & Toplak, 2019). Table 1 also indicates that the relationship with AOT is stronger for social liberalism than with economic liberalism. This is consistent with past research showing that social and economic ideology often display different correlations (Carl, 2015; Carl et al., 2016; Pennycook et al., 2020; Stanovich & Toplak, 2019; Yılmaz & Sarıbay, 2017). Table 1 also indicates a relationship between AOT and political party affiliation that is somewhat lower (0.269) than that with ideology. Democrats scored higher on the AOT than did Republicans and Independents (the mean total scores of the three groups on the AOT were 61.3, 56.7, and 59.4, respectively).

All of the measures of ideology and partisanship displayed strong negative correlations (from −0.478 to −0.618) with right-wing authoritarianism (RWA). Liberals/Democrats scored lower on the RWA scale. Thus, it is not surprising that the AOT displayed a substantial negative correlation with RWA (–0.474). What is notable, however, are the pattern of relationships displayed by the left-wing authoritarianism (LWA) variable. Here, the partisan/ideological variables displayed low/moderate *positive* correlations with LWA (from 0.288 to 0.316). Because liberals/Democrats scored higher on the LWA scale, and because the AOT is moderately correlated with liberalism/Democratic party affiliation, it might be expected that those scoring higher on the AOT scale would also score higher on the LWA. But as the table indicates, that was not the case. AOT scores were negatively correlated with scores on the LWA scale, and significantly so (–0.195). This creates a pattern where the AOT is negatively correlated with *both* types of authoritarian thinking (RWA and LWA). While it is true that AOT is correlated with liberal ideology, it seems to be associated with the parts of liberal ideology that are not linked to authoritarian thinking of the left-wing variety.

Table 2 again displays the pattern of AOT, but not liberal ideology, tracking adaptive behavioural and psychological states. The correlations

Table 2. How the ideology composite and AOT correlate with the other variables in the study.

	Liberal ideology	AOT
Paranormal beliefs	−0.076	−0.381
Narcissism	−0.048	−0.344
Machiavellianism	0.097	−0.094
Psychopathy	0.025	−0.192
Dark triad composite	0.032	−0.274
Paranoia	−0.053	−0.336
AEA	0.018	0.033
HCFS	−0.208	−0.261
Government credulity	0.146	−0.192
Religiosity composite	−0.347	−0.329

Note: all correlations larger than 0.076 in absolute value are significant at the 0.05 level, and correlations larger than 0.126 in absolute value are significant at the 0.001 level.

AOT = Actively Open-Minded Thinking scale; AEA = Anti-Establishment Attitudes scale; HCFS = Hidden Causal Forces scale.

involving several variables that associate with epistemic accuracy and adaptive behaviour are displayed. The first row indicates that paranormal thinking, a strong correlate of unjustified beliefs (Bensley et al., 2022; Ståhl & van Prooijen, 2018; Stanovich & Toplak, 2025a), displayed a substantial negative correlation with AOT (–0.381), but a correlation with liberal ideology of only −0.076 (barely significant at the 0.05 level). Ideology did not display a significant correlation with the Dark Triad composite and correlated significantly only with the Machiavellianism compartment—and in this particular case, the correlation was in the direction of liberal subjects displaying more Machiavellianism. In contrast, the AOT displayed a *negative* correlation with the Dark Triad composite (–0.274) and correlated significantly in the negative direction with each of the three Dark Triad components. Likewise, ideology did not correlate significantly with responses on the Paranoia scale, but the AOT displayed a substantial −0.336 correlation.

Neither ideology nor the AOT correlated with anti-establishment attitudes (the AEA scale), one of the indicators of a sceptical political attitude. Liberal ideology displayed a significant negative correlation with the HCFS and a significant positive correlation with scores on the Government Credulity scale. That is, liberal ideology is associated with avoiding excessive scepticism (measured by the HCFS) but is *positively* correlated with displaying excessive credulity. Interestingly, the AOT displays significant negative correlations with *both* the HCFS and Government Credulity scales. That is, those scoring highly on the AOT tend to avoid excessive scepticism and *also* avoid excessive credulity. Again, to repeat the point, the AOT has a substantial correlation with liberalism (see Table 1). However, across the many different variables in Table 2, it is the AOT, not liberalism itself, that strongly tracks healthy psychological and political attitudes, and those fostering epistemic accuracy. The last line of the table indicates that ideology and AOT show similar moderate negative correlations with the religiosity composite variable.

In Table 3, we examine the predictors of performance on the mature conspiracy belief items. The first column examines the predictors of the ability to discriminate true from false mature conspiracy beliefs. Political liberalism displayed a positive correlation with discrimination ability (0.211), but the correlation of discrimination ability with the AOT (0.362) was significantly higher ($t(679) = 3.71$, $p < 0.001$; Steiger [1980] test for dependent correlations)). Most of the remaining variables displayed negative or nonsignificant correlations, except for the Machiavellianism and Psychopathy scales which displayed significant positive correlations, but of magnitudes much lower than the AOT scale.

The next two columns present correlations with the endorsement of false conspiracy beliefs and true conspiracy beliefs, respectively. Looking at the sign of the correlations here is instructive. An adaptive psychological variable would be one that is positively correlated with the endorsement of true conspiracy beliefs and negatively correlated with false beliefs. The

Table 3. Predictors of the ability to distinguish true from false conspiracies.

	d′ Discrimination index	False conspiracies	True conspiracies
AOT	0.362	−0.380	0.041
Liberal ideology – composite	0.211	−0.251	−0.051
Paranormal beliefs	−0.338	0.558	0.223
Narcissism	−0.154	0.207	0.051
Machiavellianism	0.081	0.089	0.224
Psychopathy	0.120	0.022	0.178
Dark triad composite	0.020	0.138	0.197
Paranoia	−0.174	0.277	0.137
AEA	−0.035	0.478	0.493
HCFS	−0.310	0.768	0.485
Government credulity	−0.178	−0.123	−0.352
Religiosity composite	−0.321	0.304	−0.045

Note: all correlations larger than 0.076 in absolute value are significant at the 0.05 level, and correlations larger than 0.126 in absolute value are significant at the 0.001 level.
AOT = Actively Open-Minded Thinking scale; AEA = Anti-Establishment Attitudes scale; HCFS = Hidden Causal Forces scale.

AOT is the only variable that displays this pattern. Two of the variables (ideology and the Government Credulity scale) display the desired negative correlation with false conspiracy beliefs, but they are also negatively correlated with the belief in true conspiracies (strongly so in the case of government credulity). Several variables display the desired positive correlation with true conspiracy beliefs but also have positive correlations with false conspiracy beliefs (the Dark Triad and its components, paranoia, paranormal beliefs, the HCFS, and the AEA scale). Religiosity displays the non-adaptive pattern of showing positive correlations with belief in false conspiracies and negative correlations with belief in true conspiracies. Thus, every possible pattern of signed correlations is displayed in Table 3, but only the AOT displays the adaptive pattern of a negative correlation with false belief and a positive (albeit, not significant) correlation with true belief. It is thus unsurprising that AOT displays the strongest positive correlation with discrimination ability.

Table 4 displays the correlates of anti-democratic attitudes and the tendency to support political violence. Here again, the AOT scale stands out. It is the only variable that displayed significant negative correlations with each of the criterion variables. With one exception, all of the other predictors displayed positive correlations with the two criterion variables. The religiosity composite was the exception, displaying two nonsignificant negative correlations. Some of the positive correlations were not statistically significant in the case of anti-democratic attitudes, but all of the positive correlations with the endorsement of political violence were statistically significant. The tendency to display credulity towards government actions was a particularly strong correlate of anti-democratic attitudes, followed by liberal political ideology. In the case of political violence, all three components of the Dark Triad were moderate predictors as well as paranoia. Overall, it is notable that even though the AOT is positively correlated with liberal ideology, and that liberal ideology is positively

Table 4. Predictors of anti-democratic attitudes and the tendency to endorse political violence.

	Anti-democratic attitudes	Political violence
Paranormal beliefs	0.196	0.126
Narcissism	0.184	0.312
Machiavellianism	0.066	0.356
Psychopathy	0.030	0.348
Dark triad composite	0.121	0.441
Paranoia	0.159	0.346
AEA	0.017	0.117
HCFS	0.021	0.111
Government credulity	0.463	0.151
Religiosity composite	−0.045	−0.068
Liberal ideology	0.320	0.186
AOT	−0.147	−0.199

Note: all correlations larger than 0.076 in absolute value are significant at the 0.05 level, and correlations larger than 0.126 in absolute value are significant at the 0.001 level.
AEA = Anti-Establishment Attitudes scale; HCFS = Hidden Causal Forces scale; AOT = Actively Open-Minded Thinking scale.

Table 5. How the ideology composite and AOT correlate with various contested beliefs.

	Liberal ideology	AOT
The attempted assassination of Donald Trump in Pennsylvania in July, 2024 was a fake assassination staged by the Trump campaign to generate sympathy for him	0.343	−0.152
The way the founders of the United States set things up ensures that, even today, only whites can be truly free and successful	0.350	−0.065
The way the founders of the United States set things up ensures that, even today, only men can be truly free and successful	0.387	−0.035
Prestigious universities conspire to keep out minority students.	0.235	−0.213
Women are discriminated against in getting a university degree.	0.488	0.061
Men secretly agree among themselves to keep women down.	0.230	−0.189
Whites and Asian-Americans rig the economy so that they come out on top.	0.141	−0.226
American institutions are designed to pay women substantially less than men for doing exactly the same work.	0.393	0.011
Most living white Americans are descended from people who owned American slaves.	0.230	−0.176

Note: all correlations larger than 0.076 in absolute value are significant at the 0.05 level, and correlations larger than 0.126 in absolute value are significant at the 0.001 level.

related to anti-democratic attitudes and the endorsement of political violence, the AOT displayed significant negative correlations with both of these variables. The part of liberal ideology that the actively open-minded mindset is related to is not the problematic part of the ideology that is associated with anti-democratic tendencies or with support for political violence.

Table 5 displays how ideology and AOT scores correlate with various contested beliefs. The first item was: "The attempted assassination of Donald Trump in Pennsylvania in July, 2024 was a fake assassination staged by the Trump campaign to generate sympathy for him". As a contemporary conspiracy belief, it seems to be a fairly unlikely one, but nevertheless it

was endorsed at some level by 28.7% of our sample. More importantly, it posits a plot that impugns the motives of the Trump campaign. Table 5 indicates that this property creates a moderate 0.343 correlation between belief in the proposition and ideology in the expected direction: liberals found the proposition more believable than did conservatives. Interestingly though, AOT scores were significantly *negatively* correlated with belief in the proposition (–0.152). This is true despite the fact that the AOT is moderately correlated with ideology (see Table 1).

The next item in Table 5 is an item that has been studied by Shermer (2022; McCaffree & Saide, 2022). It is a claim that there is profound systemic discrimination embedded in long-term institutional structures that still operate today to produce discrimination: "The way the founders of the United States set things up ensures that, even today, only whites can be truly free and successful." Although the claim is rather absolute and sweeping, it was endorsed at some level of agreement by 36.8% of our sample. More importantly, it is a proposition containing a profound critique of American society and thus is more likely to be endorsed by liberal respondents, as indicated by the positive 0.350 correlation in Table 5. However, as with the previous item, the positive correlation was not mimicked by performance on the AOT scale, which showed a nonsignificant negative relationship (–0.065).

The third item is another statement studied by Shermer (2022; McCaffree & Saide, 2022) that claims profound systemic discrimination embedded in long-term institutional structures that still operate today to produce discrimination, but this time the discrimination is based on sex: "The way the founders of the United States set things up ensures that, even today, only men can be truly free and successful." The claim was endorsed at some level agreement by 40.6% of our sample. Its critique of the founding of the United States is more likely to be endorsed by liberal respondents, as indicated by the positive 0.387 correlation in Table 5. However, as with the previous item, the positive correlation was not mimicked by AOT, which showed a nonsignificant negative relationship (–0.035).

The fourth item proposes that there is racial discrimination in admissions at prestigious universities: "Prestigious universities conspire to keep out minority students". In light of the decades-long existence of affirmative action programs at such universities (Bowen & Bok, 1998), the proposition seems dubious, but perhaps those endorsing the proposition have in mind earlier time periods, rather than the present. The sample contained 230 individuals (33.7% of the sample) who endorsed the proposition at some level of agreement, and they were more likely to be liberal ideologically (correlation with ideology composite = 0.235). However, when it comes to the AOT, despite its positive correlation with liberalism, high scorers were more likely to *oppose* the proposition, resulting in a significant *negative* correlation (–0.213).

The fifth item is similar to the fourth, but in this case proposes that there is sex discrimination in getting a university degree: "Women are

discriminated against in getting a university degree". In light of statistics indicating that women have earned the majority of university degrees for a couple of decades (Hurst, 2024), the proposition seems implausible, but perhaps those endorsing the proposition have in mind earlier time periods, rather than the present. The sample contained 263 individuals (38.6% of the sample) who endorsed the proposition at some level of agreement, and they were more likely to be liberal ideologically (the correlation with the ideology composite was a quite substantial 0.488). However, the correlation with AOT was nonsignificant, although positive (0.061).

Item six posits a conscious conspiracy to disadvantage women: "Men secretly agree among themselves to keep women down". The sample contained 188 individuals (27.6% of the sample) who endorsed the proposition at some level of agreement, and they were more likely to be liberal ideologically (correlation with the ideology composite = 0.230). However, when it comes to the AOT, despite its positive correlation with liberalism, high scorers were more likely to oppose the proposition, resulting in a significant negative correlation (–0.189).

Sometimes trust in social institutions can be undermined because systems become so complex and interactive that they are hard to trace and thus tend to spawn beliefs in systemic collusion. Uscinski (2020, pp. 92–95) discusses the logic of beliefs in so-called "long term rigging". Item seven tapped this kind of belief: "Whites and Asian-Americans rig the economy so that they come out on top." Although the statement might seem dubious, the sample contained 126 individuals (18.5% of the sample) who endorsed the proposition at some level of agreement, and they were significantly more likely to be liberal ideologically (correlation with ideology composite = 0.141). However, when it comes to the AOT, despite its positive correlation with liberalism, high scorers were more likely to *oppose* the proposition, resulting in a significant *negative* correlation (–0.226).

Item eight is a factual proposition that has been the subject of much misleading commentary: "American institutions are designed to pay women substantially less than men for doing exactly the same work." Economic research on the issue emphasises the "same work" caveat on the proposition and tends to apply stringent statistical controls to make sure the caveat is achieved. When this is done, there is little evidence that, currently, women receive less pay for carrying out the same work with the same qualifications (CONSAD Research Corporation 2009; Kolesnikova & Liu 2011; O'Neill & O'Neill 2012; Phelan 2018). Nevertheless, political communications often emphasise the proposition that "women make 84 cents for every dollar a man makes in the workplace" (eliding the critical comparative feature that the comparison should be conditionalized on doing the same work if the phrase is to be interpreted as an indicator of discrimination). It is not surprising then, that many people would ignore the "equal work" provision in proposition eight. It is likely that this was the case in our study, as 68.0% of the sample endorsed the proposition at some level of agreement. Endorsement was a potent trend among liberals in our sample,

as ideology displayed a positive 0.393 correlation with endorsement. Despite the strength of this trend towards liberal endorsement of the proposition, and the fact that AOT correlated 0.356 with liberalism (see Table 1), the AOT itself displayed no correlation with endorsement of this proposition (0.011).

The last item is a factual proposition: "Most living white Americans are descended from people who owned American slaves." The statement is a substantial exaggeration (research queries to AI chatbots produce no evidence that the percentage is above 10%). However, politicised narratives of white culpability may have made some people prone to believe the overstatement. Indeed, 46.3% of the sample endorsed the proposition at some level of agreement, and they were significantly more likely to be liberal ideologically (correlation with ideology composite = 0.230). However, when it comes to the AOT, despite its positive correlation with liberalism, high scorers were more likely to disagree with the statement, resulting in a significant *negative* correlation (–0.176).

In summary, across the nine contested propositions, ideological liberalism correlated significantly with affirming each of the statements, but in no case was AOT positively correlated (7 of the 9 correlations were negative and 5 of the 9 were significantly negative). In all nine cases, the correlation with AOT was significantly lower than that with ideology (Steiger [1980] test for dependent correlations; all $p < 0.001$).

Discussion

These results help to clarify the nature of the connection between actively open-minded thinking and liberal ideology. Although the two are correlated in this study, we have shown numerous dissociations. Liberalism *without* AOT does not associate with positive epistemic outcomes, but the converse (high AOT without liberalism) often does. Liberalism is moderately correlated with left-wing authoritarianism, but the AOT shows a significant *negative* correlation. Performance on the AOT shows significant negative correlations with a host of variables that disrupt epistemic rationality (e.g., paranormal beliefs, paranoia, the Dark Triad, government credulity) but liberal ideology either does not correlate with these variables or correlates in the wrong direction (see Table 2).

Liberalism and the AOT were the only variables in the study that significantly correlated in the positive direction with the ability to discriminate true from false conspiracy beliefs, but the AOT displayed a significantly larger correlation. The liberal ideology composite displayed significant positive correlations with both anti-democratic attitudes and the tendency towards political violence, whereas the AOT displayed significant negative correlations with both of these variables.

The contested beliefs examined in the study were designed to be enticing to liberal/left-wing respondents and thus to address the question

of whether high AOT intensified or attenuated belief in ideologically-linked contested propositions. The results indicate that, as deliberately designed, all of the contested belief items had substantial positive correlations with liberalism (see Table 5), but the correlations with AOT tended to be negative or zero. Clearly, the overall pattern is that, when contested information is highly partisan, high AOT scores were associated with the ability to avoid the partisan lure.[4]

What is the property of AOT that allows it to align with the adaptive side of behavioural and epistemic variables? Our conjecture is that it is the decontextualising and decoupling features of AOT that allow high AOT thinkers to escape the trap of ideologically-congenial conclusions that are dubious. Avoiding ideology-saturated reasoning requires detaching from partisanship as a context for reasoning. This is an uncommon form of reasoning, as is perspective-taking, its close cousin.

Detaching, decontextualising, and perspective-taking are uncommon forms of reasoning because they involve a cognitively demanding process that has been termed cognitive decoupling (Oaksford & Chater 2012; Stanovich, 2011, 2004; Stanovich & Toplak, 2012, 2023). Decoupling serves to prevent our representations of the real world from becoming confused with representations of imaginary situations. In tripartite models of mind, the decoupling itself is accomplished by the algorithmic mind, but the initiation signal to commence the decoupling operation originates in the reflective mind (Stanovich, 2009, 2011).

The process of decoupling involves a sort of distancing from what we currently believe, and that is why it is a rare mental style. But AOT scales may be measuring the tendency to employ it. For example, many belief revision items on AOT scales require the subject to hold an existing belief in abeyance while simulating the effect of new information on the original belief ('People should revise their conclusions in response to relevant new information")—classic cognitive decoupling. Other AOT items tap the willingness to consider possibilities beyond the focal model that is in the mind: "Considering too many different opinions often leads to muddled thinking" (reverse-scored), "Changing your mind is a sign of weakness" (reverse-scored), and "A person should always consider new information". AOT scales capture global attitudes that make people more willing to decouple from strong default responses and to consider new and/or conflicting evidence. Thus, cognitive decoupling is perhaps the key cognitive attitude that allows AOT to signal healthy epistemic attitudes.

[4] AOT serves as a suppressor variable for ideology. When AOT is controlled, liberalism is more strongly correlated with each of the nine contested beliefs in Table 5, compared with its zero-order correlation. The same was true when anti-democratic attitudes and political violence are predicted from AOT and ideology. All of these suppressor relationships are illustrated in Table S2 of the Supplementary Materials which displays the relevant regression beta weights in comparison to the zero-order correlations.

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The authors report there are no competing interests to declare.

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Data availability statement

Data from the study are available at: https://osf.io/rq7ys/files/osfstorage.

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