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You believe what?!: Relational closeness and belief relevance predict conspiracy belief tolerance

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Abstract
Hardly a day passes without seeing the negative consequences of conspiracy beliefs manifest in headline news. While a great deal of research has examined the causes and consequences of believing conspiracy theories, relatively little research has examined the reaction to one's belief in conspiracy theories from one's social network. We asked participants to indicate how they would react if a family member, friend, or co-worker believed a series of conspiracy theories (e.g., Would they be willing to tolerate those beliefs? Would they be willing to confront those beliefs?). Also, we examined the role of Actively Openminded Thinking (AOT; Svedholm-Hakkinen & Lindeman, 2018) to examine the extent to which it predicted the belief in conspiracy theories and the acceptance of those beliefs in others. Study 1 and Study 2 were nearly identical, except the former consisted of an internet sample and the latter consisted of college students. Together, the data from these studies revealed that conspiracy beliefs that had direct consequences for the participant were less likely to be tolerated and more likely to be confronted. The closer the relationship of the believer to the participant, the more likely the participant was to tolerate and confront the belief. Finally, AOT scores were associated with a decreased tendency to believe in conspiracies and an increased tendency to confront those beliefs in others. These data inform our understanding of social and individual factors that lead to confrontation of conspiracy beliefs and increase our understanding of the AOT construct.

Keywords Conspiracy beliefs · Tolerance · Relationships · Social media · Social influence · Social networks · Actively openminded thinking

People have always believed in conspiracy theories but, in modern times, uncritical presentation of these theories provided by internet sources, especially social media, allows for easy access and reinforcement of these beliefs, increasing their adoption and potency (Mills, 2021). The extant literature operationalizes conspiracy theories as beliefs relating to a secret plot orchestrated by powerful groups with bad intentions (Mills, 2021). Although conspiracy theories are not definitionally false, belief in them predicts beliefs in superstitions and the paranormal (Darwin et al., 2011). While considerable work has been conducted on individuals who adopt conspiracy beliefs (e.g., Swami et al., 2014), little work has focused on how those beliefs are tolerated in one's social network. Conspiracy beliefs have the potential to create conflict with members of one's existing social network when those beliefs are incongruent with the normative beliefs of one's social network. Understanding individual (personality) and situational (relationship tie strength) factors that predict conspiracy belief tolerance is critical to understanding the persistence of conspiracy beliefs and predicting when those beliefs lead to confrontation.

The current studies examine conspiracy belief tolerance among one's social network: specifically, the family, friends, and co-workers who do not hold these beliefs. We examine whether social tie strength (operationalized as relationship closeness), conspiracy belief relevance (operationalized as whether the belief is directly consequential), and personality predict one's willingness to tolerate or confront those who hold conspiracy beliefs. Finally, we examine the construct of Actively-Openminded Thinking (AOT; Baron, 1993) and the extent to which it predicts tolerance of these beliefs in others.

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Belief in conspiracy theories

Conspiracy theories can satisfy several overlapping motives. Douglas and colleagues (2019) categorized these as epistemic, existential, and social motives. Epistemic motives involve a desire for one's beliefs to persist—even in the face of ambivalence and conflict (Douglas et al., 2019), which increase as uncertainty increases. For example, if existing beliefs are threatened, complex explanations can justify why the beliefs are, actually, correct. Existential motives involve asserting a sense of control (Douglas et al., 2017), which increase under perceived threat or powerlessness. For example, believing that one possesses unique, valuable information about conspiracies implies enhanced capability to understand and predict reality increasing one's sense of control over their environment. Social motives involve a desire to perceive one's self or group as unique or special and are particularly prevalent among low-status groups (Douglas et al., 2019). For example, if one belongs to a low-status group, the idea that this group is uniquely persecuted can increase self-esteem by providing an explanation for the status.

In addition to the aforementioned belief in the supernatural (Darwin et al., 2011), belief in conspiracy theories has been linked to several cognitive and personality factors. For instance, several studies have shown a significant positive relationship between belief in conspiracy theories and right-wing authoritarianism (e.g., Grzesiak-Feldman & Irzycka, 2009) and significant negative relationship with rational and analytical thinking (e.g., Swami et al., 2014). In other cases, the relationship between belief in conspiracy theories and well-established constructs where one would expect to find a clear link have produced mixed results. For example, belief in conspiracy theories has an inconsistent relationship with Need for Cognitive Closure (e.g., Marchlewska et al., 2018) and Openness to Experience (Swami et al., 2014).

Understanding the belief in conspiracy theories, then, does not feature a simple explanation. Different traits and characteristics are tapped for specific beliefs, possibly driven by distinct, underlying motivations. However, widespread belief in conspiracy theories can have a detrimental impact, not only on the individuals who hold the beliefs, but the rest of society, too. Belief in conspiracy theories is associated with a general distrust of science (Lewandowsky et al., 2013) and authority (Abalakina-Paap et al., 1999). Indirectly, this can contribute to less public support for pressing issues like climate change (Lewandowsky et al., 2013) or public health measures (Jolley & Douglas, 2014). Directly, holding extreme views can lead to an individual acting on these beliefs, either alone (as with the gunman who marched into Comet Ping Pong to liberate non-existent victims of a supposed pedophile ring; Miller, 2021) or collectively (as with January 6th rioters attacking the U.S. Capital based on unfounded accusations of a stolen election; Fischer, 2021). Moreover, belief in one conspiracy theory is correlated to belief in others (Bruder et al., 2013) increasing the potential negative downstream consequences.

Unsurprisingly, one's own beliefs are often influenced by the beliefs of individuals around them, including friends, family, and acquaintances. Decades of research show that we use others to assess whether something is correct (Festinger, 1954) and normal (Baron et al., 1996). In many assessments, the more similar people are to us, the more we seek them out for the purpose of comparison and the more influential the comparison tends to be (Suls et al., 2000). Similarly, the more important the relationship is to us, the more influential it is (Orina et al., 2002). While these close, personal relationships can describe the source of conspiracy beliefs, they can also provide a source of resistance to those beliefs (e.g., Dube et al., 2016). Those in close relationships with someone harboring conspiracy beliefs can exert disproportionate influence (Latané, 1981) leading to belief change through confrontation (Latané, 1996). However, confrontation from socially close others can foment severe conflict and potentially bolster initial conspiracy beliefs (see Tormala & Petty, 2002, 2004 as examples of increased resistance after the presentation of counter-attitudinal information). As stated previously, these beliefs serve specific functions (Douglas et al., 2019), and confronting these beliefs undercuts those functions, which can be threatening (Brehm, 1966).

Recent U.S. news reports are filled with stories about families and communities being driven apart by beliefs about a stolen election (Del Real, 2021), vaccinations (Hoffman, 2021), and elite cabals of Satanic pedophiles (Jaffe & Del Real, 2021). Holding beliefs that deviate from one's group can lead to social exclusion (Schachter, 1951). While this exclusion may be good for group cohesion (Dijker & Koomen, 2007), it can be physically and psychologically detrimental to the deviant individual (Williams, 1997). Additionally, ostracized individuals are significantly more likely (than non-ostracized individuals) to endorse conspiracy beliefs. Therefore, one can be ostracized for holding a conspiracy belief that deviates from one's social network, which makes one more likely to endorse additional conspiracy beliefs, leading to greater propensity for future exclusion. Moreover, extremist groups use the internet to recruit individuals who feel ostracized by society, increasing the potential for further conspiracy beliefs (Guadagno et al., 2010) and the radicalization of individuals who begin by holding a single conspiracy belief. Thus, understanding when individuals tolerate versus confront those who hold conspiracy beliefs is important.

Outside of situational attributes (social relationships), tolerance of those who hold conspiracy beliefs also depends on dispositional attributes. One dispositional attribute likely correlated with tolerance is Actively-Openminded Thinking. We examined whether Actively-Openminded Thinking predicts one's willingness to believe conspiracy theories, tolerate the belief in others, and to confront the beliefs of others.

Actively-openminded thinking

Actively-Openminded Thinking (AOT) is a concept that was first established by Baron in 1985. Although its exact definition and components vary slightly across publications, the basic ideas behind the concept are consistent. Most conceptualizations include one's ability to analyze arguments without influence from their own biases or beliefs (Mellers et al., 2015; Stenhouse et al., 2018) which contrasts with the tendency to defend prior beliefs. In the original version of the AOT scale (Stanovich & West, 1997), the construct tapped avoidance of epistemological absolutism, willingness to perspective-switch, willingness to decontextualize, and the tendency to consider alternative opinions and evidence. AOT is thought to involve two processes: (1) seeking out counter-attitudinal information and (2) actively processing this information (Stenhouse et al., 2018). However, it should be noted that the *willingness* to analyze an argument is not the same as the *ability* to analyze an argument (Stenhouse et al., 2018).

Baron (2019) describes AOT as having three functions. First, it is a norm for the evaluation of thinking. Second, it is a set of dispositions to think in accord with the norm. Finally, it is a norm for evaluating other people's thinking. The term "disposition" is often used to describe AOT, rather than "capacity," because the former describes something that can be taught (Stanovich & West, 1997), as is the case with AOT (Swami et al., 2014).

AOT has been shown to predict argument quality (Stanovich & West, 1997), more thorough information acquisition and predictive accuracy (Haran et al., 2013), and weighing new evidence against a favored belief (Haran et al., 2013). AOT is distinct from the concept of Openness to Experience because it involves a willingness and capacity to update one's beliefs (Stenhouse et al., 2018). However, Stenhouse and colleagues (2018) describe this as "fairness" toward possibilities that we initially disfavor, not automatic acceptance.

Previous research indicates that AOT has a negative relationship with conspiracy beliefs (Swami et al., 2014). However, it is unclear whether this will translate into tolerance of such beliefs in others or a willingness to confront these beliefs, because research on AOT's connection to interpersonal relationships is relatively sparse. Some facets of AOT positively correlate with measures of social competence, but these findings did not indicate how one would behave regarding the beliefs of others (Svedholm-Hakkinen & Lindeman, 2018). On one hand, one would expect individuals high in AOT to acknowledge that they lack all the answers and respect the opinion of others, which would lead to tolerance and a lack of confrontation. Alternately, as with the beliefs in the ideas themselves, "open-mindedness" does not translate to a lack of critical analysis, and high AOT individuals might be willing to call out beliefs and behaviors that lack merit. After all, Baron (2019) partly characterizes AOT as a norm for evaluating the thinking of others. The question would remain, though, whether that thinking (i.e., intolerance) leads to action (i.e., confrontation). The high AOT individual's response may be contingent on the nature of the belief espoused by this other person and the natural of the relationship to this other person.

Other constructs examined

We also examined the Openness to Experience subscale of the Big Five Inventory – Short Form (Benet-Martínez & John, 1998). Openness to Experience is another commonly used measure for "open-mindedness" (Flynn, 2005). Although we expected it to positively correlate with AOT (Stanovich & West, 1997), previous studies led us to anticipate that it will not perform the same as AOT. "Openness to experience refers to an individual's willingness to explore, tolerate, and consider new and unfamiliar ideas," (Homan et al., 2008) but it lacks the component of critical analysis described by Baron (2019).

Because the study involved interpersonal decisions (specifically, a willingness to confront another about their beliefs), we also examined the Agreeableness subscale of the Big Five Inventory – Short Form (Benet-Martínez & John, 1998), as well as the Social Desirability Scale (Strahan & Gerbasi, 1972). We expected that these measures would be negatively associated with a willingness to confront.

Finally, because some conspiracy theories fall along political fault lines, and because political orientation generally bears a significant relationship to belief in conspiracy theories (Douglas et al., 2019), we measured participants' political orientation as a control variable. AOT has shown a negative relationship with conservatism (Stenhouse et al., 2018).

Preregistration

We preregistered this study early in the process of study development. After preregistering our experimental hypotheses, we discovered a publication that contradicted one of

our predictions. Specifically, Swami and colleagues (2014) established an inverse relationship between AOT and belief in conspiracy theories. Therefore, only our first preregistered hypothesis, predicting the opposite, is incorrect and should be thought of as exploratory. All other pre-registered hypotheses remain unchanged from the original pre-registration. In addition, to the pre-registered hypotheses we also list our exploratory non-preregistered hypotheses below.

Preregistered hypothesis

1) AOT and Openness scores will be negatively [pre-registered as positively] associated with participants' belief in conspiracy theories. This affect will be stronger for Conservatives than Liberals;
2) AOT, Openness, Agreeableness, and SDS scores will be negatively associated with participants' willingness to confront others about others' belief in conspiracy theories. AOT and Openness should remain significant, even accounting for Agreeableness and SDS scores;
3) There will be greater reported willingness to confront the beliefs of others when those beliefs have personal consequences for the participant;
4) Participants will be more willing to confront friends who believe in conspiracy theories than coworkers or family members.

Exploratory hypotheses

5) AOT will have a positive relationship with participants' willingness to tolerate a target's belief in conspiracy theories;
6) AOT will be inversely related to participants' willingness to confront a target about the target's conspiracy-related beliefs;
7) A target's conspiracy beliefs that are directly relevant to participants will be less likely to be tolerated;
8) When the target holding the conspiracy beliefs bears a close relationship to the participant, the participant will be less likely to tolerate the beliefs.

Study 1 Methods

Participants

We recruited 452 participants through Mechanical Turk who were paid $1.00 for their participation. To qualify for the study Mechanical Turk workers had to have a human intelligence tasks (HIT) rating approval greater than 95% and have completed between 100–5,000 HITs. Of these participants, 435 provided usable data based on our pre-registered exclusion criteria. We disclose all measures, manipulations, and exclusion criteria in the paper or within the supplemental materials and used power analyses to determine the required sample to detect our effects. The Studies in this paper were pre-registered (https://osf.io/gka24). All data and supplementary analyses are deposited on the Open Science Framework (https://osf.io/eazyj). No analyses took place until data collection ended. All participants provided informed consent and all studies were approved by [redacted for blind review] an institutional review board. A post hoc power analysis indicated that 150 participants would be needed to detect a medium ($F = 0.25$) effect at 95% power. Participants were excluded prior to the analyses if their study duration was more than three standard deviations above the mean time to complete the survey, failed the attention check question, guessed the study hypotheses, and/or did not provide appropriate or complete answers to the survey questions. Of these, 264 participants identified as female, 169 as male, and 2 as another category. A total of 331 participants identified as White, while 40 identified as Black, 34 as Asian, two as Native American, 15 as multiple ethnic categories, and 13 as "Other." Participants' average age was 41.15 years ($SD = 13.93$), and they indicated they primarily grew up in 42 different states, along with the District of Columbia. The most frequently represented states were California (41), New York (41), Florida (32), and Texas (30).

Procedure

To assess their attitudes toward conspiracy theories, participants received a one-sentence, author-generated statement describing a conspiracy theory and were asked to indicate the extent to which they agreed with the statement using the following scale: 1 = "*Not at all*," 5 = "*Extremely*." Participants who indicated agreement with the conspiracy statement (by choosing a value of 3 or greater) were taken to the next section of the survey. Those indicating little to no agreement with the conspiracy theory (selected "1" or "2") answered additional questions. In total, participants received six statements describing conspiracy theories: "Facemasks are ineffective in limiting the spread of COVID-19," "Climate change is a hoax," "Vaccines cause autism," "The U.S. government is suppressing evidence of extraterrestrial life," "The Earth is flat," and "There is an unidentified monster living in Loch Ness, Scotland." These conspiracy theories were chosen because they were relatively common (for conspiracy theories) and because they differed in the degree to which they present direct consequences for the participants (i.e., believing that facemasks are ineffective could increase risk of virus transmission while a belief in the Loch Ness Monster is relatively innocuous for non-Scottish respondents). To validate the items, 21 participants in a separate

analysis were told, "For each statement, imagine that someone you knew believes that statement and indicate the extent to which this person's beliefs could have direct consequences for you." The first three conspiracy theories were rated as significantly more consequential than the last three when combined into two composite variables ("Consequential Beliefs" vs. "Non-Consequences Beliefs"), $t\ (20) = 5.07$, $p < 0.001$. Participants indicating disagreement with the conspiracy statements received follow-up questions described below.

Each participant received questions pertaining to one type of relationship: family member, friend, or co-worker. Thus, the wording of these questions remained consistent for every participant across conspiracy theories. Therefore, Belief Consequences was a within-subjects variable, because all participants received all statements, while the relationship type was a between-subjects variable, because each participant only received items worded to pertain to a family member, a friend, or a co-worker. Going forward, we refer to this as the "Target Relationship" variable.

Outcome variables

Belief in conspiracy theories One of the primary hypotheses involved examining one's belief in conspiracy theories. To do this, we created composite variable based on participants' responses to the question, "To what extent do you agree with this statement?" (1 = "*Not at all*," 5 = "*Extremely*"), which was asked six times for each participant (i.e., once after the presentation of each conspiracy theory). Inter-item reliability was slightly low, $\alpha = 0.64$, but close enough to warrant inclusion. In general, belief in conspiracy theories for the current sample was low ($M = 1.76$, $SD = 0.62$).

Tolerance of conspiracy beliefs in others A second hypothesis involved the degree to which participants were willing to tolerate conspiracy beliefs in others. To examine this, we created composite variables based on participant responses to the question, "How tolerant are you of the [family member/friend/co-worker]?" (1 = "*Not at all tolerant*, 5 = "*Extremely tolerant*"). For each participant, we created two composite variables. The first applied to the three conspiracy theories that one could plausibly argue have a direct impact on the participant, those involving facemasks not preventing the spread of COVID-19, climate change being a hoax, and vaccines causing autism (i.e., "Consequential Beliefs"). The second variable applied to the three conspiracy theories that likely had no direct impact on participants, those involving the existence of the Loch Ness Monster, the Earth being flat, and the U.S. government covering up evidence of aliens (i.e., "Non-Consequential Beliefs"). Inter-item reliability was high, $\alpha = 0.84$, for both sets of items.

Willingness to confront To examine the degree to which participants were willing confront others about their conspiracy beliefs we created composite variables based on participant responses to the question, "If your [family member/friend/co-worker] expressed this belief, how likely would you be to confront this person on the validity of their beliefs?" (1 = "*Not at all*," 5 = "*Extremely*"). As with the tolerance analysis, we used three items to create a Consequential Beliefs variable and three items to create a Non-Consequential Beliefs variable. Inter-item reliability was adequate, considering that both variables contained only three items, $\alpha = 0.71$ for Consequential Beliefs and $\alpha = 0.61$ for Non-Consequential Beliefs.

Passive responses In order to examine passive, non-confrontational responses to the conspiracy beliefs of another, and because many of these beliefs are spread online, we examined two additional outcome variables. We asked participants, "How willing are you to continue having the [family member/friend/co-worker] as a social media friend?" and "How willing are you to read social media posts from the [family member/friend/co-worker]?" Both questions were answered using a five-point scale: 1 = "*Not at all willing*," 5 = "*Very willing*." For each question, we once again created separate variables for Consequential and Non-Consequential Beliefs. For the question about maintaining social media friendships, inter-item reliability was high for Consequential Beliefs, $\alpha = 0.89$, and Non-Consequential Beliefs, $\alpha = 0.84$. For the questions about reading the online posts of others, inter-item reliability was high for Consequential Beliefs, $\alpha = 0.91$, and Non-Consequential Beliefs, $\alpha = 0.85$.

Political orientation

Participants were asked, "How would you describe your general political views?" and responded using the following scale. 1 = "*Extremely Liberal*," 2 = "*Liberal*," 3 = "*Slightly Liberal*, 4 = "*Moderate*," 5 = "*Slightly Conservative*," 6 = "*Conservative*," 7 = "*Extremely Conservative*." The mean score for the sample was 3.52 ($SD = 1.74$), indicating that participants in the study leaned liberal.

Perceived knowledge

Responses to the questions, "How knowledgeable are you regarding this issue?" (1 = "*Not at all*," 5 = "*Extremely*") were combined into a composite Perceived Knowledge variable pertaining to the conspiracy theories for which a participant answered questions. This was assessed in order to account for the fact that some participants may not perceive

themselves as having enough knowledge to formulate an opinion. Inter-item reliability for this variable was adequate, $\alpha = 0.70$. The mean Perceived Knowledge score was 3.42 ($SD = 0.73$) indicating most participants believed they possess some knowledge on the conspiracy beliefs.

Cognitive and personality measures

Actively open-minded thinking scale A primary predictor of interest is the 17-item Actively Open-minded Thinking Scale (AOT; Svedholm-Hakkinen & Lindeman, 2018). It is comprised of four subscales: A six-item Dogmatism scale, a five-item Fact Resistance subscale, a three-item Liberalism subscale, and a three-item Belief Personification subscale. Participants received a series of statements (e.g., "A person should always consider new possibilities.") and responded to each using a scale ranging from 1 ("*Strongly Disagree*") to 5 ("*Strongly Agree*").

Inter-item reliability for the original Svedholm-Hakkinen and Lindeman (2018) publication was adequate, $\alpha = 0.75$, and reliability for the subscales ranged from $\alpha = 0.43$ (Liberalism) to 0.67 (Dogmatism and Fact Resistance). For the current sample, inter-item reliability for the full scale and all subscales was higher. Reliability for the full AOT scale was high, $\alpha = 0.84$. For the subscales, reliability was as follows: Dogmatism, $\alpha = 0.80$, Fact Resistance, $\alpha = 0.80$, Liberalism, $\alpha = 0.57$, Belief Personification, $\alpha = 0.57$. While the reliability for Belief Personification and Liberalism were the lowest, this is expected for subscales with only three items and both scales showed greater reliability than in the Svedholm-Hakkinen and Lindeman (2018) publication. The mean AOT score for the Study 1 sample was 3.64 ($SD = 0.56$).

Social desirability The ten-item Social Desirability Scale (SDS; Strahan & Gerbasi, 1972) features a series of self-referential statements that participants are asked to rate as "true" (coded "1") or "false" (coded "0"). With each choice, participants can frame themselves in a more flattering light (e.g. "I have never intensely disliked anyone."), so higher scores on this scale indicate an effort to respond in a socially desirable manner. Strahan and Gerbasi (1972) established that the internal reliability for this scale ranged from $\alpha = 0.49$ to $\alpha = 0.75$. The inter-item reliability for the current sample was toward the high end of this range, $\alpha = 0.68$. The mean SDS score for the Study 1 sample was 5.30 ($SD = 2.24$) on a scale of 0 to 10.

Big five personality inventory-short form The 44-item Big Five Inventory-Short Form measures respondents' Openness to Experience, Conscientiousness, Extraversion, Agreeableness, and Neuroticism (Benet-Martínez & John, 1998). Participants receive one sentence fragment, "*I see myself as someone who…*," and for each item that completes the statement (e.g., "*is talkative*") they indicate the degree to which they agree that the item applies to them using a nine-point, Likert-like scale (1 = "*strongly disagree*", 9 = "*strongly agree*"). The inter-item reliability for the original use of the scale was quite high, with alphas ranging from 0.80 to 0.87.

For the current study, we shortened the scale to a five-point scale (1 = "*strongly agree*," 5 = "*strongly agree*") to be consistent with the rest of the survey. Also, we were only interested in Agreeableness, $\alpha = 0.81$, and Openness to Experience, $\alpha = 0.84$, both of which showed high reliability. The current study also showed that Openness to Experience had a significant positive correlation with AOT scores, $r\,(435) = 0.33$, $p < 0.001$, while Agreeableness showed a significant positive correlation with SDS scores, $r\,(435) = 0.50$, $p < 0.001$. The mean Openness to Experience score for the current sample was 3.67 ($SD = 0.70$). The mean Agreeableness score was 3.86 ($SD = 0.68$).

Study 1 Results

We failed to specify all the covariates that we intended to add to our analyses plan in the pre-registration across studies. The pre-registration stated that we would run a series of mixed design ANCOVAs using Target Relationship as the between subject's variable, Belief Consequence as a within subjects' factor, and Political Affiliation as a covariate. Results from the specified pre-registration analyses (using political affiliation as the sole covariate) for both studies can be found on the supplemental materials listed deposited on the Open Science Framework. We intended to specify additional covariates in the pre-registration that would be added to those models as, in some cases, this covaried analysis is what prompted us to measure these variables (e.g., social desirability). Below we analyze these relations first with no covariates and then with all pre-planned covariates. Thus, while the analyses below examine our intended relationships, they include additional covariates that were not specified in the original pre-registration plan and should therefore be treated as exploratory rather than confirmatory.

Beliefs

First, we examined factors that predict belief in conspiracy theories using the entire sample. We conducted a linear regression using Belief (in conspiracy theories) as an outcome variable, AOT scores and Openness to Experience as predictors, and Social Desirability, Perceived Knowledge, and Political Orientation as covariates. The overall regression was significant, $F\,(5, 430) = 30.13$, $p < 0.001$. AOT significantly predicted belief, $t\,(430) = -4.25$, $p < 0.001$,

such that greater open-mindedness was associated with less belief in conspiracy theories. Openness to Experience failed to reach significance, $p = 0.096$.

In terms of covariates, Perceived Knowledge predicted belief, t (430) = 2.42, $p = 0.016$, such that participants who considered themselves knowledgeable about the conspiracy theories presented were more likely to believe them. Political orientation also predicted belief, t (430) = 8.85, $p < 0.001$, such that greater conservatism was associated with greater belief in conspiracy theories. Social Desirability failed to reach significance, $p = 0.779$.

Liberals vs. Conservatives We also examined the effect of these factors for self-identified liberals (defined as those participants indicating that they were extremely liberal, liberal, or slightly liberal on the Political Orientation variable) and conservatives (defined as those indicating that they were extremely conservative, conservative, or slightly conservative) independently. To do this, we used the same regression analysis for both samples, except that we removed Political Orientation from the list of covariates.

For liberals, the overall regression was significant, F (4, 210) = 4.19, $p = 0.003$. AOT significantly predicted Belief, t (210) = -3.40, $p = 0.001$, such that greater open-mindedness was associated with less belief in conspiracy theories. Openness to Experience was significant as well, t (210) = 2.19, $p = 0.030$, but in contrast to AOT, greater openness to experience was associated with *greater* belief in conspiracy theories. In terms of covariates, Perceived Knowledge predicted belief, t (210) = 2.02, $p = 0.045$, such that participants who considered themselves knowledgeable about the issues presented were also more likely to believe conspiracy theories. Social Desirability failed to reach significance, $p = 0.574$.

For conservatives, the overall regression was significant, F (4, 110) = 2.57, $p = 0.042$. AOT significantly predicted belief, t (112) = -2.60, $p = 0.011$, such that greater open-mindedness was associated with less belief in conspiracy theories. Openness to Experience, $p = 0.582$, Perceived Knowledge, $p = 0.087$, and SDS, $p = 0.682$, failed to reach significance.

Tolerance

To examine the effect of Target Relationship and Belief Consequences on tolerance, we conducted a mixed ANOVA on the questions involving "How tolerant are you of the X?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor. When these factors were examined by themselves (i.e., with no ordinal predictors or covariates), Belief Consequences, F (1, 399) = 35.23, $p < 0.001$, $\eta^2 = 0.081$, was significant (see Table 1), such that there was less tolerance for beliefs with direct consequences. Target Relationship, F (2, 399) = 6.63, $p = 0.001$, $\eta^2 = 0.032$, was also significant; post-hoc Scheffè tests revealed significantly greater tolerance for family than co-workers, $p = 0.002$. There was no significant interaction effect, $p = 0.564$.

Next, AOT scores and Openness to Experience were included as ordinal predictors, and Social Desirability,

Table 1 Mean dependent variable scores across target conditions (Study 1)

	Family ($n = 133$)	Friend ($n = 135$)	Co-Worker ($n = 134$)	Total ($n = 402$)
Tolerance				
Consequential Beliefs	3.47 (SD = 1.21)	3.25 (SD = 1.16)	2.98 (SD = 1.16)	3.23 (SD = 1.19)
Non-Consequential Beliefs	3.78 (SD = 1.09)	3.47 (SD = 1.20)	3.34 (SD = 1.10)	3.53 (SD = 1.14)
Willing to confront				
Consequential Beliefs	3.65 (SD = 1.07)	3.31 (SD = 1.16)	2.90 (SD = .92)	3.29 (SD = 1.10)
Non-Consequential Beliefs	3.28 (SD = 1.13)	3.14 (SD = 1.19)	2.71 (SD = 1.17)	3.04 (SD = 1.19)
Willing to maintain social media relationship				
Consequential Beliefs	3.83 (SD = 1.20)	3.46 (SD = 1.20)	3.09 (SD = 1.29)	3.46 (SD = 1.27)
Non-Consequential Beliefs	3.95 (SD = 1.04)	3.55 (SD = 1.21)	3.23 (SD = 1.17)	3.58 (SD = 1.17)
Willingness to read social media posts				
Consequential Beliefs	3.34 (SD = 1.34)	3.04 (SD = 1.33)	2.70 (SD = 1.26)	3.03 (SD = 1.33)
Non-Consequential Beliefs	3.61 (SD = 1.15)	3.32 (SD = 1.30)	2.91 (SD = 1.23)	3.28 (SD = 1.26)

Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences became non-significant, $p = 0.564$. AOT scores, F (1, 393) = 7.65, $p = 0.006$, $\eta^2 = 0.019$, Political Orientation, F (1, 393) = 17.98, $p < 0.001$, $\eta^2 = 0.044$, and Perceived Knowledge, F (1, 393) = 13.38, $p < 0.001$, $\eta^2 = 0.33$. produced significant interaction effects. When examining its effect on the different levels of Belief Consequences, AOT scores showed a significant correlation with Consequential Beliefs, r (407) = -0.16, $p = 0.002$, such that greater open-mindedness was associated with less tolerance for conspiracy beliefs. AOT's correlation with Non-Consequential Beliefs was not significant, $p = 0.691$. Analyses of all covariates are included on the OSF page. Openness to Experience was not significant, $p = 0.102$.

When examining between-subjects effects, Target Relationship remained significant, F (2, 393) = 10.14, $p < 0.001$, $\eta^2 = 0.049$ (see Table 1). AOT, $p = 0.747$, and Openness to Experience, $p = 0.412$, failed to provide significant interactions with this factor. In terms of covariates, Political Orientation (i.e., conservatism) provided a significant interaction, F (1, 393) = 45.53, $p < 0.001$, $\eta^2 = 0.104$, as did Agreeableness, F (1, 393) = 11.17, $p = 0.001$, $\eta^2 = 0.028$ (see OSF page).

Willingness to confront

A mixed ANOVA was conducted on the questions involving "If X expressed this belief, how likely would you be to confront this person on the validity of their beliefs?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor. When these factors were examined by themselves, Belief Consequences, F (1, 399) = 14.96, $p < 0.001$, $\eta^2 = 0.036$, was a significant predictor, such that there was greater willingness to confront regarding beliefs with direct consequences (see Table 1). Target Relationship, F (2, 399) = 18.16, $p < 0.001$, $\eta^2 = 0.083$, was also significant; post-hoc Scheffè tests revealed that participants were more willing to confront family, $p < 0.001$, and friends, $p = 0.001$, than co-workers. There was no significant interaction effect, $p = 0.375$.

Next, AOT scores and Openness to Experience were included as ordinal predictors, and Social Desirability, Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences became non-significant, $p = 0.564$. AOT scores, F (1, 393) = 7.19, $p = 0.008$, $\eta^2 = 0.018$, and Political Orientation, F (1, 393) = 11.26, $p = 0.001$, $\eta^2 = 0.028$, produced significant interaction effects. AOT scores showed a significant correlation with Consequential Beliefs, r (407) = 0.22, $p < 0.001$, such that greater open-mindedness was associated with greater willingness to confront. AOT's correlation with Non-Consequential Beliefs was not significant, $p = 0.709$. Analyses of covariates are included in the OSF page. Openness to Experience was not significant, $p = 0.749$.

When examining between-subjects effects, Target Relationship remained significant, F (2, 393) = 19.91, $p < 0.001$, $\eta^2 = 0.092$. AOT, $p = 0.740$, and Openness to Experience, $p = 0.271$, failed to provide significant interactions with this factor. In terms of covariates, Perceived Knowledge provided a significant interaction, F (1, 393) = 23.98, $p < 0.001$, $\eta^2 = 0.058$ (see OSF page).

Willingness to maintain social media relationship

A mixed ANOVA was conducted on the questions involving "How willing are you to continue having X as a social media friend?" using Belief Consequences as the within-subjects factor and the Target Relationship (family/friend/co-worker) as the between-subjects factor. When these factors were examined by themselves, Belief Consequences, F (1, 399) = 6.32, $p = 0.012$, $\eta^2 = 0.016$, was significant, such that there was less willingness to maintain social media relationships when beliefs with direct consequences were involved (see Table 1). Target Relationship, F (2, 399) = 15.06, $p < 0.001$, $\eta^2 = 0.070$, was also significant; post-hoc Scheffè tests revealed family relationships were more likely to be maintained than friend, $p = 0.017$, and co-worker relationships, $p < 0.001$, and friend relationships were more likely to be maintained than co-worker relationships, $p = 0.033$. There was no significant interaction effect, $p = 0.913$.

Next, AOT scores and Openness to Experience were included as ordinal predictors, and Social Desirability, Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences became non-significant, $p = 0.169$. AOT scores, F (1, 393) = 5.49, $p = 0.020$, $\eta^2 = 0.014$, Political Orientation, F (1, 393) = 24.71, $p < 0.001$, $\eta^2 = 0.059$, and Perceived Knowledge, F (1, 393) = 10.41, $p = 0.001$, $\eta^2 = 0.026$, produced significant interaction effects. AOT scores showed a non-significant negative correlation with willingness to maintain social media relationships over Consequential Beliefs, $p = 0.148$, but a non-significant positive correlation with Non-Consequential Beliefs, $p = 0.138$. Analyses of covariates are included in the OSF page. Openness to Experience was not significant, $p = 0.630$.

When examining between-subjects effects, Target Relationship remained significant, F (2, 393) = 21.86, $p < 0.001$, $\eta^2 = 0.100$. AOT, $p = 0.087$, and Openness to Experience, $p = 0.906$, failed to provide significant interactions with this factor. In terms of covariates, Political Orientation, F (1, 393) = 55.36, $p < 0.001$, $\eta^2 = 0.123$, and Agreeableness, F (1, 393) = 16.89, $p < 0.001$, $\eta^2 = 0.041$, showed significant interaction effects (see OSF page).

Willingness to read social media posts

A mixed ANOVA was conducted on the questions involving "How willing are you to read social media posts and comments from X?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor. When these factors were examined by themselves, Belief Consequences, F (1, 399) = 26.79, $p < 0.001$, $\eta^2 = 0.063$, was significant, such that there was less willingness to read social media posts when beliefs with direct consequences were involved (see Table 1). Target Relationship, F (2, 399) = 10.98, $p < 0.001$, $\eta^2 = 0.052$, was significant; post-hoc Scheffè analyses revealed that participants were more likely to read posts from family, $p < 0.001$, and friends, $p = 0.035$, than co-workers. There was no significant interaction effect, $p = 0.836$.

Next, AOT scores and Openness to Experience were included as ordinal predictors, and Social Desirability, Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences became non-significant, $p = 0.198$. AOT scores, F (1, 393) = 7.09, $p = 0.008$, $\eta^2 = 0.018$, Political Orientation, F (1, 393) = 19.66, $p < 0.001$, $\eta^2 = 0.048$, and Perceived Knowledge, F (1, 393) = 7.75, $p = 0.006$, $\eta^2 = 0.019$, produced significant interaction effects. AOT scores showed a significant negative correlation with willingness to read social media posts for Consequential Beliefs, r (402) = -0.12, $p = 0.019$, and a non-significant positive correlation for Non-Consequential Beliefs, $p = 0.557$. Analyses of covariates are included in the OSF page. Openness to Experience failed to provide a significant interaction, $p = 0.630$.

When examining between-subjects effects, Target Relationship remained significant, F (2, 393) = 15.56, $p < 0.001$, $\eta^2 = 0.073$. AOT, $p = 0.715$, and Openness to Experience, $p = 0.777$, failed to provide significant interactions with this factor. In terms of covariates, Political Orientation, F (1, 393) = 40.53, $p < 0.001$, $\eta^2 = 0.093$, and Agreeableness, F (1, 393) = 14.26, $p < 0.001$, $\eta^2 = 0.035$, showed significant interaction effects (see OSF page).

Exploratory analyses

In effort to understand the role of open-mindedness, we examined the relationship between the AOT subscales and factors that the full AOT scale predicted: Beliefs, Tolerance regarding Consequential Beliefs, Confrontation regarding Consequential Beliefs, and a willingness to read social media posts in response to Consequential Beliefs (see Table 2). Two of the four subscales behaved the same as the full AOT scale, with Fact Resistance and Dogmatism showing negative relationships with beliefs, tolerance, and willingness to read social media posts, and a positive relationship with willingness to confront. Liberalism showed no relationship with belief, tolerance, or willingness to read social media posts, but showed a positive relationship with willingness to confront. The fourth subscale, Belief Personification, showed no relationship to belief, a significant positive relationship with tolerance and willingness to read social media posts, and a significant negative relationship to willingness to confront.

Study 1 Discussion

There was a clear pattern that participants were less willing to tolerate the beliefs of others and more willing to confront another person over those beliefs when those beliefs had the potential to produce direct consequences for the participant, compared to when the beliefs had little chance of producing direct consequences. Although the main effect for this factor became non-significant when included with multiple linear predictors and covariates, there is a clear difference in magnitude between beliefs with direct consequences and beliefs with no direct consequences.

Table 2 AOT subscales correlated to outcome variables that AOT predicted (Study 1; $n = 402$)

	1	2	3	4	5	6	7	8
1. AOT	1							
2. Dogmatism	.90**	1						
3. Fact Resistance	.85**	.74**	1					
4. Liberalism	.60**	.41**	.37**	1				
5. Belief Personification	.31**	.04	–.03	.14*	1			
6. Belief	–.29**	–.31**	–.28**	–.05	–.03	1		
7. Tolerance for Consequential Beliefs	–.15*	–.27**	–.27**	.04	.31**	.33**	1	
8. Willingness to confront Consequential Beliefs	.22**	.23**	.20**	.28**	–.11*	–.19**	–.08	1
9. Willingness to read social media posts (Consequential Beliefs)	–.12*	–.21**	–.24**	.04	.29**	.28**	.70**	–.04

* < .05, ** < .001

Another clear pattern was that participants were more willing to tolerate the beliefs in close relationships (i.e., friends and family), more willing to maintain those relationships despite conspiracy beliefs, *and* were more willing to confront those who held conspiracy beliefs, as compared to more distant relationships (i.e., co-workers). In this case, the relationship closeness remained statistically significant, even when analyzed along with the ordinal factors and covariates.

AOT behaved in a consistent manner: it was associated with less belief in conspiracy theories (regardless of whether participants were liberal or conservative), less tolerance in conspiracy theories, and greater willingness to confront others about belief in conspiracy theories. This was the case even while controlling for Political Orientation, which was a powerful driver of these outcomes. We did not expect this performance, perhaps overestimating the acceptance aspect of AOT and underestimating the analytical component. However, AOT performance could be an important finding going forward, due to its ability to be taught, and how higher AOT seems to act as a buffer to endorsing conspiracy beliefs. Indeed, when examining Table 2, it is clear that the Belief Personification subscale performed in a way that ran counter to the performance of the Dogmatism and Fact Resistance subscales. Svedholm-Hakkinen and Lindeman (2018) characterized this subfactor as "a refusal to judge people for their opinions" and found that it often failed to align with the other subfactors. The overall performance of the AOT scale may have come down to the fact that Dogmatism and Fact Resistance accounted for over three times the number of items as Belief Personification. In contrast, Openness to Experience predicted greater belief in conspiracy theories among liberals and nothing else.

Although Agreeableness showed several significant interactions with Target Relationship, including analyses of tolerance and willingness to maintain a social media relationship read social media posts, it failed to do so in the analysis of willingness to confront. In contrast, social desirability did not significantly predict any outcomes.

In sum, Study 1 provides initial evidence that people are less tolerant of consequential conspiracy beliefs in their social networks, as those beliefs are likely to cause negative outcomes for themselves and, perhaps, members of that social network. Additionally, Study 1's results inform one possible behavioral consequence of that intolerance, confrontation. Study 1's results suggest that people are most likely to confront socially close others (e.g., Family) over their conspiracy beliefs compared to those more distant in their social network (e.g., co-workers). Finally, these data suggest that the relationships between tolerance and confrontation of those in one's social network who hold consequential conspiracy beliefs are impacted not just by contextual factors but also by individual difference factors such as AOT, where higher AOT led to greater intolerance and increased likelihood to confront.

Study 2 Methods

With a clearer idea of how the variables interacted, we attempted to replicate the results of Study 1 using a sample of college students from the Midwestern United States. A total of 174 individuals provided usable data for the study. The criteria for exclusion of participants was the same for Study 1 (see pre-registration). Of these, 88 participants identified as female, 78 identified as male, and 2 identified as another category. A total of 92 participants identified as White, while 52 identified as Black, six as Asian, one as Native American, nine as multiple ethnic categories, seven as "Other," and seven did not answer the question. The average age of participants was 19.95 years ($SD = 4.83$). A total of 157 participants indicated that they primarily grew up in Ohio.

Procedures

The procedures were nearly identical to Study 1. The only difference is that Openness to Experience and Social Desirability were not analyzed in Study 2. This is because the smaller sample size motivated us to remove extraneous variables and because neither of these variables significantly predicted anything of consequence in Study 1.

Outcome variables

Belief in conspiracy theories Inter-item reliability was lower than in Study 1, $\alpha = 0.51$, but for the sake of consistency, we analyzed them as a composite variable. Belief in conspiracy theories for the current sample was still low ($M = 1.99$, $SD = 0.59$) but higher than Study 1.

Tolerance of belief in others Inter-item reliability for both sets of tolerance items was, once again, high: $\alpha = 0.84$ for Consequential Beliefs and $\alpha = 0.83$ for Non-Consequential Beliefs.

Willingness to confront Inter-item reliability was slightly lower than in Study 1, but still adequate, considering that both variables on contained only three items, $\alpha = 0.57$ for Consequential Beliefs and $\alpha = 0.63$ for Non-Consequential Beliefs.

Willingness to maintain social media relationship Inter-item reliability was high, $\alpha = 0.87$ for Consequential Beliefs and $\alpha = 0.79$ for Non-Consequential Beliefs, and comparable to the values in Study 1.

Willingness to read social media posts Inter-item reliability was high, $\alpha = 0.85$ for both Consequential Beliefs and Non-Consequential Beliefs, which is comparable to Study 1.

Political orientation

Participants indicated their political orientation, ranging from 1 = "*Extremely Liberal*" to "7 = "*Extremely Conservative*." The mean score for the sample was 3.76 ($SD = 1.41$), indicating that participants in Study 2 leaned liberal. However, the sample was more conservative than the Study 1 sample, which is surprising given that college students comprised the Study 2 sample. This may be due to the population being almost exclusively from the Midwest.

Perceived knowledge

We again asked participants how knowledgeable they are about the different conspiracy theories and created a composite Perceived Knowledge variable. This variable showed adequate reliability, $\alpha = 0.71$. The Perceived Knowledge mean for Study 2 ($M = 3.06$, $SD = 0.81$) was lower than in Study 1.

Cognitive and personality measures

Actively open-minded thinking scale Once again, we used the full scale for Svedholm-Hakkinen and Lindeman's (2018) Actively Open-minded Thinking Scale (AOT). Inter-item reliability was adequate, $\alpha = 0.75$. Because of the smaller sample size, we did not examine the AOT subscales in the Study 2 analyses. The mean AOT score for Study 2 ($M = 3.41$, $SD = 0.44$) was lower than Study 1.

Big five personality inventory-short form We again used the Big Five Inventory-Short Form (Benet-Martínez & John, 1998) to measure participants' Agreeableness. Due to the smaller sample size in Study 2 and the fact that Openness to Experience did not serve as a significant predictor in Study 1, we excluded it from the analysis. The Agreeableness subscale showed adequate reliability, $\alpha = 0.79$. The mean Agreeableness score for Study 2 ($M = 3.83$, $SD = 0.64$) was nearly identical to Study 1.

Study 2 Results

Belief

We conducted a linear regression using Belief as an outcome variable, AOT scores as a predictor, and Perceived Knowledge and Political Orientation as covariates. The overall regression was significant, $F\,(3, 164) = 10.45$, $p < 0.001$. AOT significantly predicted belief, $t\,(163) = -3.52$, $p = 0.001$, such that greater open-mindedness was associated with less belief in conspiracy theories.

In terms of covariates, Political Orientation predicted belief in conspiracy theories, $t\,(163) = 3.83$, $p < 0.001$, such that greater conservatism was associated with stronger belief in conspiracy theories. Perceived Knowledge was not significant, $p = 0.329$.

Tolerance

A mixed ANOVA was conducted on the questions involving "How tolerant are you of X?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor (see Table 3). When examined by themselves (i.e., with no covariates or ordinal predictors), Belief Consequences was significant, $F\,(1, 148) = 13.45$, $p < 0.001$, $\eta^2 = 0.083$, but Target Relationship was not, $p = 0.716$. While the relative values of Consequential vs. Non-Consequential Beliefs remained relatively unchanged in comparison to Study 1, in Study 2, there was virtually no difference between the respective values of family and friends. There was no significant interaction effect, $p = 0.592$.

Next, AOT was included as an ordinal predictor, and Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences become non-significant, $p = 0.429$. AOT scores, $p = 0.277$, were not significant. The only measure that produced a significant interaction effect was Political Orientation, $F\,(1, 144) = 7.50$, $p = 0.007$, $\eta = 0.050$ (see OSF page for covariate analysis).

When examining between-subjects effects, Target Relationship remained non-significant, $p = 0.422$ (see Table 3). AOT failed to provide a significant interaction, $p = 0.159$. As with Study 1, Political Orientation significantly interacted with participants' relationship to the target, $F\,(1, 144) = 14.47$, $p < 0.001$, $\eta^2 = 0.091$, as did Agreeableness, $F\,(1, 144) = 5.17$, $p = 0.024$, $\eta^2 = 0.035$ (see OSF page).

Willingness to confront

A repeated-measures ANOVA was conducted on the questions involving "If X expressed this belief, how likely would you be to confront this person on the validity of their beliefs?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor. When examined by themselves, this time, Target Relationship was a significant factor, $F\,(2, 148) = 5.21$, $p < 0.006$, $\eta^2 = 0.066$ (see Table 3); Post-hoc Scheffè tests revealed that family, $p = 0.013$, and friends, $p = 0.042$, were more likely to be confronted than co-workers. Belief Consequences was not significant, $p = 0.545$, nor was the interaction, $p = 0.855$.

Table 3 Mean dependent variable scores across target conditions (Study 2)

	Family ($n=49$)	Friend ($n=52$)	Co-Worker ($n=50$)	Total ($n=151$)
Tolerance				
Consequential Beliefs	3.19 (SD = 1.35)	3.34 (SD = 1.22)	3.17 (SD = 1.20)	3.24 (SD = 1.25)
Non-Consequential Beliefs	3.62 (SD = 1.13)	3.60 (SD = 1.19)	3.41 (SD = 1.16)	3.54 (SD = 1.15)
Willing to confront				
Consequential Beliefs	3.51 (SD = 1.01)	3.34 (SD = 1.15)	2.90 (SD = .82)	3.25 (SD = 1.03)
Non-Consequential Beliefs	3.37 (SD = 1.26)	3.36 (SD = 1.29)	2.83 (SD = 1.30)	3.19 (SD = 1.30)
Willing to maintain a social media relationship				
Consequential Beliefs	3.39 (SD = 1.30)	3.45 (SD = 1.27)	3.11 (SD = 1.33)	3.32 (SD = 1.30)
Non-Consequential Beliefs	3.78 (SD = 1.24)	3.74 (SD = 1.25)	3.28 (SD = 1.20)	3.60 (SD = 1.24)
Willing to read social media posts				
Consequential Beliefs	3.18 (SD = 1.37)	3.10 (SD = 1.31)	2.88 (SD = 1.25)	3.05 (SD = 1.31)
Non-Consequential Beliefs	3.54 (SD = 1.16)	3.40 (SD = 1.27)	3.07 (SD = 1.36)	3.34 (SD = 1.28)

Table 4 Strength of relationship for significant predictors of willingness to confront across target conditions (Study 2)

Ordinal predictor	Relationship to person holding the belief		
	Family ($n=133$)	Friend ($n=135$)	Co-Worker ($n=134$)
AOT			
Consequential Beliefs	.37*	.19	.05
Non-Consequential Beliefs	.37*	.28*	.33*

* < .05

Next, AOT scores was included as an ordinal predictor, and Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences remained non-significant, $p=0.057$. AOT was the only factor that produced a significant interaction effect, F (1, 144) = 4.33, $p=0.039$, $\eta^2=0.029$. Additionally, AOT scores showed a significant relationship with Consequential Beliefs, r (151) = 0.22, $p=0.006$, such that greater open-mindedness was associated with greater willingness to confront. This relationship became stronger for Non-Consequential Beliefs, r (151) = 0.33, $p<0.001$.

When examining between-subjects effects, Target Relationship remained significant, F (2, 144) = 4.74, $p=0.010$, $\eta^2=0.062$. AOT showed a significant positive relationship with willingness to confront, F (1, 145) = 11.84, $p=0.001$, $\eta^2=0.076$ (see Table 4) and significantly predicted a willingness to confront a family member. Perceived Knowledge, F (1, 144) = 6.03, $p=0.015$, $\eta^2=0.040$, also produced a significant interaction (see OSF page).

Willingness to maintain social media relationship

A mixed ANOVA was conducted on the questions involving "How willing are you to continue having X as a social media friend?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor. When examined by themselves, Belief Consequences was a significant factor, F (1, 148) = 9.27, $p=0.003$, $\eta^2=0.059$ (see Table 3). Target Relationship was not significant, $p=0.137$, nor was the interaction, $p=0.615$.

When AOT scores were included as ordinal predictor, and Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates Belief Consequences became non-significant, $p=0.447$. However, AOT scores did not produce a significant interaction effect, $p=0.495$, nor did any of the covariates.

When examining between-subjects effects, Target Relationship remained non-significant, $p=0.310$. AOT was not significant, $p=0.184$; the only significant interaction involved Political Orientation, F (1, 144) = 21.60, $p<0.001$, $\eta^2=0.130$ (see OSF page).

Willingness to read social media posts

A mixed ANOVA was conducted on the questions involving "How willing are you to read social media posts and

comments from X?" using Belief Consequences as the within-subjects factor and Target Relationship (family/friend/co-worker) as the between-subjects factor. When examined by themselves, Belief Consequences was a significant factor, F (1, 148) = 11.72, $p = 0.001$, $\eta^2 = 0.073$ $p = 0.001$ (see Table 3). Target Relationship, $p = 0.240$, and the interaction effect, $p = 0.699$, were not significant.

AOT scores and were included as an ordinal predictor, and Perceived Knowledge, Agreeableness, and Political Orientation were included as covariates. Belief Consequences become non-significant, $p = 0.839$. AOT scores were non-significant, $p = 0.063$, despite having a larger effect size for the same analysis in Study 1, $\eta^2 = 0.024$. Political Orientation, F (1, 144) = 4.84, $p = 0.029$, $\eta^2 = 0.033$, produced a significant interaction (see OSF page). Agreeableness and Perceived Knowledge were non-significant.

When examining between-subjects effects, Target Relationship remained non-significant, $p = 0.354$. AOT was also not significant, $p = 0.178$. The only significant interaction involved Political Orientation, F (1, 144) = 21.27, $p < 0.001$, $\eta^2 = 0.129$ (see OSF page).

Study 2 Discussion

The results of Study 2 largely supported the results of Study 1. Participants were more tolerant, more likely to maintain a social media relationship, and more willing to read social media posts when it came to Non-Consequential Beliefs as compared to Consequential Beliefs, and participants were more willing to confront individuals socially closer to them than individuals distant from them. Once again, AOT bore a significant negative relationship to belief in conspiracy theories and a significant positive relationship to willingness to confront. Also, across both studies, Political Orientation was a dominant factor, accounting for a large chunk of the variance in several analyses. However, it was weaker and less consistent in Study 2 than it was in Study 1, perhaps due to a less politically motivated college sample (e.g. the Study 2 sample was closer to the mid-point of the Political Orientation scale with a smaller standard deviation).

One obvious difference emerged between the two studies. In Study 1, there was a clear, consistent pattern indicating that participants viewed family and friend relationships differently, even when this difference did not reach the point of statistical significance. Tables 1 and 3 show what are effectively eight outcome metrics for each participant (direct and indirect consequences for tolerance, willingness to confront, willingness to maintain a social media relationship, and willingness to read social media posts) across the different relationship conditions. In Study 1, there was a clear numeric difference between family and friend relationships on all eight metrics, just as there was a comparable differentiation between friend and co-worker relationships. In Study 2, the differentiation between friends and co-workers remained, but the difference between family and friends virtually disappeared.

This difference could be due to the ages of the participants in the two studies. The Study 1 participants were over twice the age of the Study 2 participants, and adolescence is a time when friends taken on an increasingly important role in a person's life (Uink et al., 2017). This could blur the distinction between friends and family in the realms of tolerance, willingness to confront, etc. Also, the power dynamics within one's family shift as one ages; a 20-year-old is unlikely to have children with beliefs about conspiracy theories and has limited sway over the beliefs of their parents, while a 40-year-old may have children in late adolescence or early adulthood and may be taking on more responsibility for their parents welfare. Thus, a college underclassman's reaction to the beliefs of family members may be less relevant than it will be later in life, whereas their influence on friends' beliefs may be at its peak. Across the eight variables, there was an average drop of 0.17 from Study 1 to Study 2 in terms of mean scores pertaining to family, and an average increase of 0.10 in terms of mean score pertaining to friends (see Tables 1 and 3).

In addition, Study 2 featured a much smaller sample than Study 1, so even if a relationship between variables produced a comparable effect size, it is less likely to reach statistical significance. This makes the conclusions drawn from Study 2 inherently conservative but adds to the veracity of the findings.

Thus, Study 2 again supports the idea that people have greater intolerance of consequential (compared to non-consequential) conspiracy beliefs of those in their social networks, are more likely to confront socially proximal (compared to distal) others who hold those beliefs, and continues to demonstrate the negative relationship of AOT and conspiracy beliefs and willingness to confront. Moreover, Study 2 again demonstrated a novel metric of tolerance, digital contact. Study 2's results again suggest people's intolerance of those in their social networks who hold conspiracy beliefs manifests similarly in online environments where participants report less willingness to digitally engage with consequential conspiracy believers.

General discussion

Conspiracy theory beliefs that have direct consequences for participants were less likely to be tolerated, more likely to disrupt social media relationships, and more likely to be confronted, compared to beliefs that had no direct consequences. This is consistent across both studies and not surprising, given that more relevant threats are more likely to

warrant a response than less relevant threats (Wormwood et al., 2016). A more surprising finding of these studies is the consistency of a seeming paradox: The closer the relationship participants had with a target, the more likely they were to tolerate the beliefs of that target, maintain a social media relationship with that target, *and confront that target*. However, the relationships where we are more willing to tolerate deviant beliefs for the sake of preserving the relationship may also be the relationships for which we are willing to fight to preserve the relationship. That is, if an important person in our life has a belief that is toxic to the relationship, confrontation may be the only way to *save* the relationship, even though this tactic would otherwise be deemed risky. This would be in contrast to toxic beliefs of an acquaintance, because the acquaintance can be safely ignored. These data suggest that the tolerance of conspiracy beliefs in one's social network is partly determined by the amount of self-risk one believes the conspiracy belief imposes.

The role of AOT was also somewhat surprising. Using the Svedholm-Hakkinen and Lindeman (2018) scale, the "actively openminded thinking" construct equated to, at the very least, a lack of belief in conspiracy theories and a willingness to confront believers of those theories. Study 1 showed that, although the total scale showed adequate reliability, the constructs identified by the subscales were not always in the same direction. Dogmatism and Fact Resistance were almost completely responsible for this trend, largely because they accounted for 11 of the scale's 17 items. Therefore, if a participant was non-dogmatic and open to factual analyses, they were willing to call-out illogical beliefs, particularly if those beliefs could manifest direct consequences for them. More broadly, rather than involving a proclivity toward accommodation, for the purposes of these studies at least, "actively openminded thinking" can be characterized by confronting bad ideas, even in the face of social costs.

Limitations

The biggest limitation in the current study was specificity of the conspiracy beliefs identified. We attempted to provide two groups of conspiracy theories that differed in terms of their personal relevance. However, in doing so, we may not have accounted for conspiracy beliefs that differed on other dimensions and may have performed differently. For example, conspiracy theories can differ in terms of the extent to which they run contrary to available evidence, the extent to which they involve issues of ethnicity, politics, and religion, their overall popularity, etc. Accounting for factors such as these may provide greater clarity to the findings.

Another issue that begs further analysis is the justification of the tolerance and lack thereof. That is, what justification do people give for tolerating some beliefs from some people but not from others. We speculated about their reasoning, but it would valuable to obtain participants' conscious justifications. Also, in terms of confrontation, it would be worthwhile to know not only the "why" but the "when" and the "how." That is, what would confrontation look like, and are there some contexts that would be more amenable than others?

Implications

Humans are social beings that live in social networks. However, most studies on conspiracy theories examine characteristics and motivations of those who hold conspiracy beliefs with little focus on the social network within which these beliefs must exist. Few studies examine how these beliefs operate in a social network. Our data suggest that the tolerance in one's social network of those who hold conspiracy beliefs is partly determined by the perceived consequences of the existence of those beliefs and the closeness of the relation one has to the individual. Clearly demonstrating the deleterious consequences of belief in conspiracy theories may be one way to decrease their proliferation by engaging one's social network in combating these beliefs.

Open practices and data availability

In the interest of Open Science, the Studies in this paper were pre-registered (https://osf.io/gka24). All data and supplementary analyses are deposited on the Open Science Framework (). These links are anonymized for peer review. The supplemental materials on the OSF also contain some analyses as specified in the pre-registration (i.e., mixed design ANCOVAs with only political affiliation as covariates).

Declarations

Ethics approval Ethical approval was provided by The Ohio State University.

Conflict of interest On behalf of all authors, the corresponding author states that there is no conflict of interest.

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