



# Can Human Values Predict Engagement with Conspiratorial and False Content on Social Media?

## Results from a European Survey

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**Abstract:** *Introduction:* Misinformation has found fertile ground on online and social media. Middle-aged individuals have been overlooked in previous research, regardless of their societal influence. *Aim:* Understanding the role of human values and how they affect conspiratorial beliefs and misinformation discernment in this demographic group is crucial for designing future prevention efforts. *Methods:* 624 middle-aged European citizens (aged 45 to 65 years) participated in an online survey in four languages. Misinformation discernment was investigated by evaluating the accuracy of online media posts on three topics: immigration, vaccination safety, and climate change. Participants completed a values scale, a conspiratorial belief scale, and a demographics questionnaire. *Results:* Regression analyses showed that conservation had a significant positive association with conspiratorial beliefs and a negative association with the ability to discern online content. Self-transcendence showed the opposite effect. Mediation tests indicated a significant partial indirect effect of conspiratorial beliefs on the relationship between conservation values and discernment ability. Education or time spent online did not significantly differentiate the ability to discern the accuracy of online content. *Implications:* Conservation and self-transcendence values play a key role in discerning online information among middle-aged participants. These results have implications for preventing online misinformation.

**Keywords:** human values, conservation, self-transcendence, conspiratorial belief, misinformation, middle-aged citizens

## Introduction

The proliferation of false content online has seen a sharp rise through online media recently (van der Linden, 2022; Vosoughi et al., 2018). Social media, through its functions of algorithmic amplification, ease of sharing, and emotion-driven engagement mechanisms, emerged as particularly fertile ground for misinformation (Hassan et al., 2018; van Prooijen et al., 2018). While a public discussion over what is true or not has become commonplace in social and political environments, the ability to discern accurate information has emerged as a crucial skill in navigating online spaces (Altay et al., 2024; Sultan et al., 2024), particularly as citizens are now exposed to misinformation daily, with nearly one in three encountering false or misleading content (European Commission, 2018). Misinformation, defined as false or misleading information masquerading as legitimate news, regardless of intent (Allen et al., 2020), has been associated with a significant negative impact. Although the problem of information falsehood is not novel, having been examined as early as Allport and Postman's (1946) law of rumor, technology now enables the genera-

tion of unprecedented quantities of content, leading to potential harm at both individual and societal levels. These include increased polarisation and social division on important socio-scientific topics, threats to democratic processes, erosion of trust in institutions, and personal risks, such as health risks arising from hesitancy to adopt preventive actions (Adams et al., 2022; Ferreira Caceres et al., 2022). Additionally, misinformation often takes the form of conspiratorial narratives that amplify distrust and encourage maladaptive behaviors, such as promoting pseudoscientific claims (Lobato et al., 2014), influencing risky medical decisions (Varet et al., 2025), or fostering disengagement from democratic processes (Einstein & Glick, 2015; Imhoff et al., 2020; Rottweiler & Gill, 2022).

Several factors have been proposed as candidate mechanisms that increase citizens' vulnerability to believing, engaging with, and sharing false or conspiratorial content. Personality factors such as narcissism (Goreis & Voracek, 2019) and collective forms of narcissism (Cichocka et al., 2016; Uscinski et al., 2022) have been associated with conspiratorial beliefs. Cognitive styles have also been implicated, including cognitive rigidity and emotion-driven

reasoning (Pennycook & Rand, 2019; Zmigrod et al., 2019), as well as a lack of analytical or scientific reasoning (Bago et al., 2022; Küçükaydın & Ayaz, 2024; O'Brien et al., 2025; Pennycook et al., 2015). However, the topic of misinformation appears to cut across various factors and perspectives. In their analysis of the foundations of ideological belief systems, Douglas et al. (2017) and Jost et al. (2018) highlight how epistemic (e.g., the need for certainty), existential (e.g., the need to reduce threat), and relational motives (e.g., the desire for shared reality and belonging) jointly shape ideological orientations. These underlying needs influence individuals' tendency to endorse information that aligns with their pre-existing beliefs, worldviews, and value systems, thereby reinforcing ideological consistency (Ecker et al., 2022; Briñol & Petty, 2009). While psychological factors capture relatively proximal influences on how misinformation is processed, broader and more enduring frameworks of motivation, like personal values, have also been considered to play a role.

According to the Theory of Basic Human Values, values are abstract representations of what individuals consider personally meaningful and important, serving as guiding principles in people's lives (Schwartz, 1992). According to the theory, values are linked to affective processes, can motivate and guide behavior, and can function as standards or criteria for information selection, evaluating people, and justifying actions. Through cross-cultural research, Schwartz (2012) described ten basic motivational value orientations (e.g., self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence, and universalism). These values can be organized into higher-order dimensions that represent motivational opposites; for example, self-transcendence (benevolence and universalism, reflecting concern for others) versus self-enhancement (achievement and power, reflecting the pursuit of dominance and personal success), and openness to change (self-direction, stimulation and hedonism reflecting independence and novelty) versus conservation (order, conformity and tradition, reflecting security and adherence to established norms).

Although people may reflect on their values when making choices, this process is not always explicit, and values can vary in the extent to which they influence human behavior and decision-making in various settings. In considering pathways to tackling misinformation online, Piccolo et al. (2020) describe a multilayered challenge in which a technical layer (computational solutions to misinformation), a formal layer (policy and regulation-related solutions), and an informal layer (including emotions, beliefs, and human values) must all be addressed. Although values hold a prominent theoretical role, the question of how they influence individuals' ability to discern misinformation online has been the subject of limited research. In a UK study, Far-

rell et al. (2019) examined how Schwartz's value orientations affected judgments of online misinformation. Participants classified online statements as true or false, and their textual explanations were qualitatively analyzed to correspond to Schwartz's value framework. Results indicated that conservation values were associated with greater difficulty in identifying accurate information, rendering participants more vulnerable to misinformation. Despite the small sample size ( $N = 97$ ) and the focus on non-politically contested topics, the study suggests a link between certain values and reduced online discernment ability. Consistently, D'Errico et al. (2022) investigated how values related to accuracy judgments and sharing intentions of misleading Instagram-style stories. In an online survey, 132 participants' self-transcendence values reduced the likelihood of sharing misleading news, whereas conservation values increased it. Similarly, Verma et al. (2019) examined how human values predicted online trust of posts, rather than accuracy discernment, using a simulated Twitter feed with 401 US participants. Their findings indicated that universalism values predicted higher trust in scientific sources, whereas achievement and security values were associated with greater trust in mainstream media. Despite preliminary findings, this research domain is still in its infancy, and conclusions to be drawn are affected by small sample sizes, methodological limitations (e.g., online posts used were fictional in some studies), and limited generalizability due to a lack of cross-cultural data and a focus on general demographic groups.

While values reflect enduring motivational factors which may shape individuals' interaction with online information, another psychological factor which has been consistently found to affect a person's tendency to engage with false and more extreme information is conspiratorial beliefs (Ecker et al., 2022; Sultan et al., 2024; Winter, 2025), defined as one's tendency to "interpret significant events as the product of malevolent group actions secretly working against the common good." (Bruder et al., 2013; p. 4).

Given that values are expected to form hierarchical systems that guide attention, evaluation and behavior, individuals who prioritize certain values may be more vulnerable to conspiratorial beliefs through an affinity to existential or social threats (Haerter, 2025). Using data from the European Social Survey and across several countries, Haerter (2025) found an association between types of values and conspiracy beliefs; specifically, with self-transcendence being less likely to endorse conspiracy theories and those with self-enhancement being more susceptible. Conspiracy beliefs affecting behavior have been associated with certain types of value orientations, particularly in the health domain. For example, in studies focusing on the relationship between value orientations and health behavior, more conservative values were associated with less engagement

in prosocial health behaviors such as vaccination (e.g., Motta & Goren, 2021; Pivetti et al., 2021), whereas values of self-transcendence had the opposite pattern (Motta & Goren, 2021; Pivetti et al., 2023; Poier & Suchanek, 2025). Some evidence also suggested complex effects, with both conservation and self-transcendence sometimes positively affecting vaccination behavior (Moosa et al., 2022; Torres et al., 2023).

Despite limited evidence, previous research indicates that self-protective values (e.g., conservation, self-enhancement) may increase vulnerability to conspiracy beliefs, while other-oriented values may have a protective effect. Though limited, research in other domains such as immigration and climate change supports these trends. Those who endorsed self-enhancement and conservation values perceived a greater threat from immigration (Walsh & Tartakovsky, 2021), and those who endorsed tradition, conformity, and power were more prone to supporting antiscientific beliefs (Maciuszek et al., 2020). Together, these findings suggest that anxiety-avoidant value orientations, which focus on maintaining stability, control, and self-interest, may offer a link between values and conspiracy beliefs.

Beyond the motivational factors discussed, factors such as age and educational level may also affect misinformation discernment. Findings regarding the impact of education on misinformation discernment have been mixed, with studies showing a protective effect (Hwang & Jeong, 2021; Huang & Wei, 2022; Imhoff et al., 2022; van Prooijen, 2017), and others a negligible effect (Enders et al., 2023; Sebalo et al., 2023). Similarly, time spent online or frequent exposure to social media has been considered a risk factor for engagement with misinformation in some studies (Meshi & Molina, 2025; Nguyen et al., 2025), although these have often focused on broad age ranges or younger cohorts (Kops et al., 2025; Selnes, 2024). Limited or too broad recruitment approaches may not sufficiently capture the unique characteristics and vulnerabilities of specific age groups, such as those in middle adulthood.

The middle-aged demographic, namely, individuals born between 1960 and 1980 (considered as Generation X), grew up in a nondigital era and may have developed a different relationship to new online media (Gao, 2024; Giarla, 2019). This generation, referred to as ‘digital immigrants’ adapted to social media later in life and may have particular online behaviour or preferences, such as a greater focus on using social media for work (Fietkiewicz et al., 2016), maintaining existing relationships (Calvo-Porrall & Pesqueira-Sanchez, 2019; Giarla, 2019) and even expressing more skepticism of online content (Calvo-Porrall & Pesqueira-Sanchez, 2019) as well as greater privacy concerns (Euarusphan, 2021; Lissitsa & Kol, 2016). Understanding factors affecting this demographic group’s engagement and acceptance of misinformation may provide insights into

the role of an influential group within society (e.g., parental, managerial, leadership roles).

Building on the literature reviewed above, this study focuses on how human values and conspiracy beliefs relate to the ability to discern misinformation in the middle-aged demographic. The study considers how different value orientations (self-transcendence, self-enhancement, conservation, openness to change) are linked to conspiratorial beliefs and individuals’ ability to discern misinformation on three socio-scientific topics: vaccination, immigration, and climate change. The study also examines the extent to which individual factors such as education and time spent on online media affect discernment ability.

The following hypotheses are proposed:

- *Hypothesis 1:* According to previous literature, we expect that higher conservation (Motta & Goren, 2021; Pivetti et al., 2021; Walsh & Tartakovsky, 2021) and higher self-enhancement (Maciuszek et al., 2020; Walsh & Tartakovsky, 2021) values will be associated with higher levels of conspiracy beliefs while, self-transcendence (Motta & Goren, 2021; Pivetti et al., 2023; Poier & Suchanek, 2025) will have a protective effect.
- *Hypothesis 2:* Consistent with prior findings (D’Errico et al., 2022; Farrell et al., 2019; Verma et al., 2019), we also expect values of conservation and self-enhancement to be associated with poorer discernment ability on the three topics (immigration, vaccination, climate change), with self-transcendence and openness to change expected to predict better discernment ability.
- *Hypothesis 3:* Given a theoretical link between values as underlying motivational factors affecting conspiracy beliefs (Haerter, 2025), we expect that conspiracy beliefs will mediate the relationship between values and discernment ability across the three topics combined.
- *Hypothesis 4:* Despite mixed findings on the effect of education on misinformation discernment (Huang & Wei, 2022; Sebalo et al., 2023), we predict that lower education and greater time on online media will decrease participants’ discernment ability.

## Method

### Overview and Design

The survey focused on the exploration of participants’ discernment ability on common socio-scientific topics (vaccine safety, migration, or climate change), previously found to be associated with misinformation content in European social media (Petersen & Johansen, 2025).

The study was a cross-sectional survey conducted through an online survey platform (Qualtrics) and delivered in four languages to capture a Europe-wide audience:

English, German, Italian, and Greek. After accounting for sufficient power for conducting regression and mediation analyses (Fritz & MacKinnon, 2007), the required total sample size for 80% power at  $\alpha = .05$ , at a small to moderate effect (paths  $a = b = .26$ ), we aimed for approximately  $N = 560$  participants. We targeted proportional recruitment per language reflecting European statistics (Van Parys, 2012), accounting for a minimum of 100 participants per language for meaningful analyses, and arrived at an expectation of recruiting around 39-40% of the expected sample in English, 27-28% in German, 17-18% in Italian, and 15-16% in Greek. Data were collected from 30 April 2024 to 7 July 2024. Ethical approval was obtained from the Cyprus Bioethics Committee EEBK EP 2023.01.316. The study was preregistered on the Open Science Framework prior to data collection/analysis (<https://osf.io/kmbpz>, Christodoulou & Iordanou, 2024). Data are available only upon reasonable request from the corresponding author. This paper reports on a subset of the planned analyses of a bigger project SMIDGE (Social Media Narratives: Addressing Extremism in Middle-Age) Grant Agreement Number 101095290 and focuses on those examining human values.

## Participants

Participants were volunteers, recruited from the crowdsourcing research website Prolific and financially compensated based on the time spent on the survey. Participation was permitted via mobile, tablet, or desktop computer. Criteria for eligibility to participate in the survey were: (1) being adults aged between 45 and 65 years old, (2) being fluent in one of the survey languages (English, German, Italian, or Greek), and (3) residing in a European country.

## Procedure

Participants saw the survey being advertised on Prolific, and upon expressing their interest, they were provided with a recruitment link that migrated them to the Qualtrics survey platform. Participants were then provided with online informed consent and proceeded with completing the survey in one session. The survey followed a fixed structure with randomization and allocation of participants into one of the three topic conditions (immigration, vaccination safety, or climate change). Upon randomization, participants were exposed to 20 social media-style online headlines, randomly balanced between factually accurate and misinformation content on one of the topics. Upon completion of this task, all participants, irrespective of condition, proceeded to complete additional questionnaires including questions on their online media use, human values, conspiracy beliefs, and demographics. To ensure data quality, the survey included attention checks and metadata controls to ascertain whether participants had fully engaged with

the tasks. A pilot study ( $N = 12$ ) was completed in January 2024, focusing on improving survey design, translations, and usability, with feedback leading to changes to improve instructions, flow, and survey length.

## Measures

### Discernment Ability

Participants were presented with 20 headlines on a topic (immigration, vaccination safety, climate change) according to their randomization condition. The headlines were presented in a similar format to a Facebook post, inspired by the design detailed by Pennycook and Rand (2019); a picture accompanied by a headline, byline, an author, and a date. Supplementary materials contain all the posts used for the study. Half of the posts were confirmed to contain misinformation according to two well-known fact-checking websites, Snopes.com and FactCheck.org, while the other half contained factually accurate information confirmed by either the same fact-checking sources or by empirical research cited in the original article and verified by the researchers. The misinformation headlines were created by taking screenshots of the cited articles or posts in the fact-checking articles. If the original post was missing or only referenced a single social media post, the researchers would rephrase the fact-checking title. For instance, one Snopes.com article on the vaccine topic, which read “Has Vaccine mRNA Entered the Food Supply via GMO Plants or Vaccinated Livestock?” was rewritten to sound assertive: “Vaccine mRNA Has Entered the Food Supply via GMO Plants and Vaccinated Livestock.” The factually accurate posts were taken either from the same fact-checking websites or from other reputable sources, i.e., theconversation.com, APnews.com, and reuters.com/fact-check. In this task, participants were asked to evaluate the accuracy of the online post (“To the best of my knowledge, the claim in the above headline is accurate”) on a 7-point Likert scale ranging from 1 = *strongly disagree* to 7 = *strongly agree*. Internal consistency reliability per topic was high for climate change ( $\alpha = .84$ ) and vaccination safety ( $\alpha = .82$ ) but lower for immigration ( $\alpha = .60$ ), which is not surprising as it may reflect a broader heterogeneity of headlines in the immigration domain (e.g., some headlines focused on the EU, others on US immigration politics).

### Short Schwartz Values Survey

The short Schwartz values survey (SSVS; Lindeman & Verkasalo, 2005) is a questionnaire adapted from the Schwartz Values Survey, assessing participants’ higher-order value orientations (self-transcendence, self-enhancement, openness to change, and conservation) through 10 items. It uses a 9-point Likert scale from -1 to 7 which ranges from

*Opposed to my principles to Of supreme importance* and asks responders to consider the importance of each value as a guiding life principle. For example, participants evaluate items within definitions (e.g., Power: social power, authority, wealth; Benevolence: helpfulness, honesty, forgiveness, loyalty, responsibility). Lindeman and Verkasalo (2005) validated the English short form, replicating the original circular structure of the theoretical model. The longer SVS scale (Schwartz, 1992) has been adapted in Italian (Schwartz, 2021) and Greek (Charalampi, 2023; Schwartz, 2021), providing the translated instructions used. Both Greek and Italian previously validated SVS were shortened for this study using the exact terminology and descriptions of each value dimension in published literature in the respective languages. The SSVS has been adapted in German by Boer (2014) and used in this study. Internal consistency reliability of the composite SSVS across languages was acceptable ( $\alpha = .77$ ).

### The Generic Conspiracist Beliefs Scale (GCBS)

The study used the 15-item GCBS (Brotherton et al., 2013), which is designed to assess general conspiracist ideation covering various topics across domains, namely, government malfeasance, malevolent global conspiracies, personal well-being (e.g., “Experiments involving new drugs or technologies are routinely carried out on the public without their knowledge or consent.”), and control of information; three items related to a fifth factor, extraterrestrial cover-up, were not included in the present study as it deviated from research motivations. To ensure contextual relevance to this study, a new item was added to capture conspiracist beliefs within the European socio-political context (“Immigration policies, especially those that affect non-European immigrants, are part of a plot designed to undermine or replace the political power and culture of European people.”). The final scale therefore consisted of 13 items which were considered to reflect a single underlying factor of general conspiracist ideation (Brotherton et al., 2013; Swami et al., 2017). Participants rated items on a 5-point Likert scale ranging from 1 (*definitely not true*) to 5 (*definitely true*). For the Italian adaptation of the tool, we used the work by Antichi et al. (2023). No formally published full validations of the GCBS were identified for the German and Greek versions, and we proceed with backward-forward translations and small-scale piloting of the resulting questionnaire. Internal consistency reliability of the GCBS across languages was high ( $\alpha = .95$ ).

### Demographics Questionnaire

Participants completed a demographics questionnaire including age, gender, education, employment status, and country of residence. Additionally, they indicated time

spent in a typical day using a website or social media on a 6-point Likert scale from not at all to more than 4 hours.

## Data Analysis

Study analyses were completed using Python (Version 3.11; Python Software Foundation, 2023) using relevant statistical libraries (pandas, numpy, pingouin, SKLearn, Statsmodels, Scipy). Data preparation followed screening for response accuracy and percentage of missing values per responder. Participants who were found to display excessive missing data or an invariant responding style ( $SD = 0$ ) were identified, and their responses were reviewed and deleted. Cases where less than 70% of values were completed on key factors were excluded, while minor missing data were replaced with median values. The normality of the distribution of all continuous factors was determined by inspecting histograms, skewness, and kurtosis values, which indicated acceptable normality for composite scores and across languages. Participants’ discernment ability was calculated by reversing the ratings for the false posts, combining the responses with the true scores, and then dividing by the total number of items. After perusing the resulting histogram, we observed that a threshold value of 5 ( $M = 4.90$ ,  $SD = 0.72$ ;  $Md = 4.90$ ) effectively divided our sample into two equal subgroups representing discernment ability (skilled/ unskilled). To ascertain measurement invariance across languages for the GCBS, we conducted factor analyses separately for each language to examine whether a single latent factor representing conspiracist belief emerged. Descriptive statistics (means, standard deviations) and bivariate correlations were computed for all main variables. Regression analyses were conducted to examine hypothesized relationships. Conspiratorial beliefs were regressed on the four value dimensions (conservation, self-transcendence, openness to change, and self-enhancement). Second, we examined whether value orientations predicted discernment ability on the various topics. Mediation analyses were then performed using Hayes (2022) PROCESS (Model 4) for Python (André, 2021) to test the hypothesized indirect effect of values on discernment through conspiratorial belief. Finally, ANOVA was used to explore the impact of education and time spent online on discernment ability.

## Results

### Data Cleaning

Data from 635 participants were screened for quality, resulting in a final sample size of 624 participants after removing low-quality responses. A total of 207 participants

were randomly allocated to the immigration topic, 210 to the vaccination topic, and 207 to the climate change topic. Upon reviewing the histograms and skewness and kurtosis values, all variables appeared to be normally or approximately normally distributed ( $|\text{skewness}|$  and  $|\text{kurtosis}| < 3$ ).

## Descriptive statistics

Table 1 summarizes the demographic information of the sample, including country of residence, questionnaire language version, age, gender, employment status, income level, education, and religion.

Table 2 illustrates the means, standard deviations, and correlations between the study variables. Relationships among study variables were mostly in the expected directions. GCBS had a moderate negative correlation with discernment ability (all the topics). Values of conservation and self-enhancement showed a small negative correlation, and self-transcendence had a small positive correlation with discernment ability. Openness values did not appear to be related to discernment ability. Consistently, GCBS was positively related to conservation and self-enhancement values but held small to no relationship with openness and self-transcendence, respectively.

## Factor Analyses of GCBS in Each Language Version

To determine whether GCBS captured a unidimensional structure reflecting conspiratorial belief across the four language versions (English, German, Italian, Greek), confirmatory factor analyses (CFAs) were conducted separately for each sample (English:  $n = 275$ ; German:  $n = 164$ ; Italian:  $n = 107$ ; Greek:  $n = 78$ ). All versions met the criteria for factor extraction. Specifically, Bartlett's tests of sphericity were significant in all samples ( $\chi^2$  range = 680.90–2744.59,  $p < .001$ ), and Kaiser-Meyer-Olkin (KMO) values confirmed sampling adequacy (KMO range = .881–.953). As expected, a single-factor solution was found across languages, consistent with the theory of GCBS. Item loadings were high and positive for all items and across languages, ranging from .74 to 1.12 in the English sample, .74 to 1.07 in the German sample, .64 to 1.11 in the Greek sample, and .73 to 1.20 in the Italian sample, showing strong convergence in all the languages.

## Hypothesis testing

### Hypothesis 1

The first hypothesis was partially supported. Regression results are shown in Table 3. We conducted a multiple linear regression to examine whether value orientations such

**Table 1.** Demographics table ( $N = 624$ )

| Variable                | Category                                | <i>n</i> | %    |
|-------------------------|-----------------------------------------|----------|------|
| Country of residence    | United Kingdom                          | 310      | 49.7 |
|                         | Italy                                   | 80       | 12.8 |
|                         | Germany                                 | 74       | 11.9 |
|                         | Greece                                  | 55       | 8.8  |
|                         | Other country                           | 56       | 9.0  |
|                         | Netherlands                             | 11       | 1.8  |
|                         | Poland                                  | 10       | 1.6  |
|                         | Austria                                 | 10       | 1.6  |
|                         | Ireland                                 | 9        | 1.4  |
|                         | Spain                                   | 9        | 1.4  |
| Survey language version | English                                 | 275      | 44.1 |
|                         | German                                  | 164      | 26.3 |
|                         | Italian                                 | 107      | 17.1 |
|                         | Greek                                   | 78       | 12.5 |
| Age (years)             | $M = 52.88$ , $SD = 5.76$ Range = 45–65 |          |      |
| Gender                  | Male                                    | 301      |      |
|                         | Female                                  | 313      |      |
|                         | Nonbinary                               | 1        |      |
|                         | Do not wish to respond                  | 5        |      |
| Employment status       | Full-time                               | 328      | 52.6 |
|                         | Part-time                               | 94       | 15.1 |
|                         | Self-employed                           | 88       | 14.1 |
|                         | Retired                                 | 39       | 6.3  |
|                         | Unemployed                              | 35       | 5.6  |
|                         | Homemaker                               | 33       | 5.3  |
|                         | Student                                 | 3        | 0.5  |
| Education               | Bachelor's degree                       | 193      | 30.9 |
|                         | Master's degree                         | 171      | 27.4 |
|                         | High-school graduate or equivalent      | 96       | 15.4 |
|                         | Trade/technical/vocational              | 66       | 10.6 |
|                         | Some college, no degree                 | 47       | 7.5  |
|                         | Ph.D.                                   | 30       | 4.8  |
|                         | Less than a high-school diploma         | 13       | 2.1  |
|                         | Prefer not to say                       | 4        | 0.6  |

Note. Percentages are rounded to one decimal place.

as conservation, self-transcendence, self-enhancement, and openness to change predicted conspiratorial beliefs. The overall model emerged as significant,  $F(4, 616) = 19.28$ ,  $p < .001$ , and explained 11.1% of the variance in conspiracy beliefs. Among the value orientations, conservation was a strong positive predictor, indicating an association with increased conspiratorial beliefs ( $\beta = 0.76$ ,  $t(616) = 7.63$ ,  $p < .001$ ). As expected, self-transcendence was a significant negative predictor ( $\beta = -0.60$ ,  $t(616) = -3.02$ ,  $p = .003$ ), suggesting a protective role. Both openness to change ( $\beta = 0.36$ ,  $t(616) = 1.84$ ,  $p = .067$ ) and self-enhancement

**Table 2.** Means, Standard deviations, and intercorrelations among study variables ( $N = 621$ )

| Variables              | 1             | 2             | 3           | 4            | 5            | 6            |
|------------------------|---------------|---------------|-------------|--------------|--------------|--------------|
| 1. Discernment Ability | —             |               |             |              |              |              |
| 2. GCBS                | -.490***      | —             |             |              |              |              |
| 3. Self-Enhancement    | -.124**       | .145***       | —           |              |              |              |
| 4. Openness            | .035          | .084          | .344***     | —            |              |              |
| 5. Self-Transcendence  | .187***       | -.038         | .054        | .440***      | —            |              |
| 6. Conservation        | -.291***      | .312***       | .406***     | .189***      | .175***      | —            |
| <i>M</i> ( <i>SD</i> ) | 98.11 (14.33) | 31.19 (12.75) | 7.60 (3.44) | 10.97 (2.92) | 13.20 (2.78) | 15.41 (5.37) |

Note. \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ . Generic Conspiracist Beliefs Scale (GCBS).

**Table 3.** Multiple regressions predicting conspiratorial beliefs and discernment ability from value orientations ( $N = 616$ )

| Outcome             | $R^2$ | Conservation (B) | $p$    | Self-Transcendence (B) | $p$    | Self-Enhancement (B) | $p$  | Openness (B) | $p$  |
|---------------------|-------|------------------|--------|------------------------|--------|----------------------|------|--------------|------|
| GCBS                | .111  | 0.76             | < .001 | -0.60                  | .003   | -0.03                | .879 | 0.36         | .067 |
| Discernment ability |       |                  |        |                        |        |                      |      |              |      |
| — All topics        | .143  | -0.89            | < .001 | 1.29                   | < .001 | 0.01                 | .977 | -0.06        | .775 |
| — Immigration       | .265  | -0.73            | < .001 | 1.20                   | < .001 | -0.22                | .290 | -0.39        | .148 |
| — Vaccination       | .073  | -0.63            | .003   | 0.55                   | .164   | -0.37                | .269 | 0.48         | .237 |
| — Climate change    | .192  | -1.08            | < .001 | 1.84                   | < .001 | 0.57                 | .079 | -0.24        | .523 |

Note. Generic Conspiracist Beliefs Scale (GCBS).

were not significant predictors ( $\beta = -0.03$ ,  $t(616) = -0.15$ ,  $p = .879$ ).

### Hypothesis 2

Hypothesis 2 was partly supported. Regression results are shown in Table 3. Four multiple linear regressions were conducted to regress value orientations on discernment ability. Firstly, we considered all the topics together (immigration, vaccination safety, climate change), arriving at a significant total model  $F(4, 616) = 25.65$ ,  $p < .001$ , which explained 14.3% of the variance. As expected, conservation values negatively predicted discernment, resulting in more misidentification of posts, while self-transcendence positively predicted discernment. Despite expectations, openness and self-enhancement were non-significant predictors. Analyses were then conducted by topic with a similar pattern of results. On the immigration topic  $F(4, 202) = 18.20$ ,  $p < .001$ , discernment ability was negatively associated with conservation and positively associated with self-transcendence. On the topic of climate change, the pattern of results remained consistent,  $F(4, 201) = 11.91$ ,  $p < .001$ ,  $R^2 = .19$ , with both conservation and self-transcendence emerging as opposing and significant predictors. The vaccination model slightly differed, with only conservation emerging as a significant predictor of engagement with misinformation  $F(4, 203) = 3.97$ ,  $p = .004$ .

### Hypothesis 3

To test Hypothesis 3, we conducted mediation analyses with value orientations found to be significant in previous models as predictors (conservation and self-transcendence),

conspiracist beliefs as a proposed mediator, and discernment ability as a dependent variable. Table 4 illustrates the numerical results. With conservation as a predictor, the total model effect on discernment ability was significant, with conservation positively predicting the mediator, conspiracy beliefs, which also negatively predicted discernment ability. Both direct and indirect effects were significant, suggesting partial mediation. On the second model with self-transcendence as the predictor, the total and direct effects on discernment ability were significant, although the indirect effect via conspiracy beliefs was not significant. The results indicate partial support for Hypothesis 3.

### Hypothesis 4

We conducted two one-way ANOVAs to examine the effect of education level and time spent online in a day on a website or social media on participants' discernment ability. Hypothesis 4 was not supported. As shown in Table 5, neither levels of education nor time spent on online media were significantly related to discernment.

## Discussion

This study considered the relationships between personal value orientations, conspiracy beliefs, and the ability to discern misinformation on three current socio-scientific topics (immigration, vaccination safety, and climate change), focusing on middle-aged citizens across multiple European

**Table 4.** Mediation analyses of the effect of values on discernment ability via conspiracy beliefs

| Predictor (X)      | Path     | B     | SE   | p      | 95% CI [LL, UL] |
|--------------------|----------|-------|------|--------|-----------------|
| Conservation       | X → M    | 0.74  | 0.09 | < .001 | [0.56, 0.92]    |
|                    | M → Y    | -0.55 | 0.04 | < .001 | [-0.63, -0.47]  |
|                    | Total    | -0.77 | 0.10 | < .001 | [-0.98, -0.57]  |
|                    | Direct   | -0.41 | 0.10 | < .001 | [-0.60, -0.22]  |
|                    | Indirect | -0.37 | 0.06 | < .001 | [-0.49, -0.26]  |
| Self-Transcendence | X → M    | -0.17 | 0.18 | .35    | [-0.53, 0.19]   |
|                    | M → Y    | -0.55 | 0.04 | < .001 | [-0.63, -0.47]  |
|                    | Total    | 0.96  | 0.20 | < .001 | [0.56, 1.36]    |
|                    | Direct   | 0.87  | 0.18 | < .001 | [0.52, 1.22]    |
|                    | Indirect | 0.09  | 0.11 | .39    | [-0.11, 0.30]   |

Note. X = Value orientations (conservation, self-transcendence), M = Conspiracy Beliefs; Y = Discernment Ability. Significant indirect effects indicate mediation.

**Table 5.** ANOVA results of demographic variables on discernment ability

| Predictor         | df     | F    | p   |
|-------------------|--------|------|-----|
| Education         | 7, 612 | 1.41 | .20 |
| Time spent online | 4, 616 | 1.46 | .21 |

Note. Dependent variable = Discernment Ability, \* $p < .01$ .

countries and in four languages. The study's findings can contribute to our understanding of cognitive and motivational factors that affect European citizens' vulnerability to misinformation and conspiratorial content on online media. We had predicted that human values would have an influential role in an individual's ability to discern information, and, partially consistent with expectations, value orientations of conservation and self-transcendence showed a significant relationship with discernment ability. Higher endorsement of conservation values (such as tradition, conformity, and security) predicted lower discernment ability, while, on the other hand, higher self-transcendence values appeared to predict enhanced discernment. Mediation analyses suggested that conspiracy beliefs partly explained the observed relationship between conservation values and discernment ability. In line with mixed findings from previous studies on the topic, for middle-aged citizens, education did not affect discernment ability, nor did time spent on online media.

The study's results suggest that values of conservation and self-transcendence may function as motivational orientations associated with increased or weaker engagement with conspiratorial beliefs, illustrating how epistemic, existential and relational motives can shape ideological positions (Douglas et al., 2017; Jost et al., 2018). From this perspective, conservation values align with existential (security) and epistemic motives (conformity, tradition), while self-transcendence values are more aligned with relational motives. The findings highlight how values can function

as guiding principles for attention and evaluation of information, affecting the interpretation of ambiguous online content (Ecker et al., 2022; Schwartz, 1992). The current results are partly consistent with Haerter's (2025) large-scale European study, which also linked self-transcendence to lower endorsement of conspiracy beliefs. However, unlike Haerter's findings, self-enhancement values did not emerge as a significant predictor in the present study. Additionally, conservation values were only influential in specific national contexts in Haerter's data. We did not perform a different analysis per country to avoid a piecemeal consideration of our dataset. This difference may be due to our study focusing on middle-aged citizens or an artifact of the way self-enhancement values operate across different situational contexts. Self-enhancement values (achievement and power) emphasize the pursuit of personal success according to one's social reality and the striving for competence and control over others (Schwartz, 1992). Therefore, self-enhancement values may influence conspiratorial beliefs when these beliefs directly threaten one's instrumental goals. However, in a non-competitive, issue-specific research context, like the present study, status motivations may not have been activated. According to Schwartz's (2012) circular motivational model, self-enhancement and openness to change share a focus on goal pursuit and personal agency. This indicates that when people endorse both self-enhancement and openness (but not conservation), they might engage in information-seeking behavior rather than cognitive defensiveness.

Building on these motivational patterns, our findings indicated that certain value orientations (namely, conservation and self-transcendence values) also related to an individual's ability to discern misinformation, contributing to findings of previous studies (D'Errico et al., 2022; Farrell et al., 2019; Verma et al., 2019). This study further extended these patterns by considering the impact of value orientations across three socio-scientific topics (immigration, vaccination

safety, and climate change), showing slight variations among topics. As expected, participants who endorsed conservation values had poorer discernment ability across all topics. This finding may be related to a tendency among individuals high in conservation values to prefer stability and order, supporting a psychological need for security and certainty (Douglas et al., 2017; Jost et al., 2018; Schwartz, 1992). We suggest that this may manifest through several pathways, one being that misinformation content is often presented in a simplified and emotionally salient format proposing a clear and noncomplex explanation of reality (Lewandowsky et al., 2017; Pennycook & Rand, 2019). Additionally, people may be more prone to accept views which they already hold, such as traditionalist views, and may be more reluctant to open up to alternative worldviews that feel threatening or distant (Briñol & Petty, 2009; Ecker et al., 2022). By contrast, self-transcendence values showed an opposite pattern, indicating a protective influence on information discernment. This orientation is consistent with relational motivation and is considered to activate empathy, fairness, and willingness to consider alternative perspectives in evaluating information (e.g., Poier & Suchanek, 2025; Schwartz, 1992). Interestingly, self-transcendence values did not exert an influence across topics, with vaccination safety resulting in a non-significant result. The lack of a protective effect of self-transcendence values on vaccination safety may indicate a more individualized frame of decision-making, reducing the focus on community protection through vaccination as the world moved beyond the COVID-19 pandemic (e.g., Seimann et al., 2025; Zimmermann et al., 2023). On the other hand, immigration and climate change topics directly elicit affiliative and prosocial motivations (e.g., stance toward immigrants, proenvironmental choices to prevent climate catastrophes) and may be more aligned with social motivations. These findings highlight that information discernment is a multifaceted skill that also reflects deeper value-based motivational structures, consistent with a tension between self-protection and growth orientations (Schwartz, 2012).

In identifying the mediating role of conspiratorial beliefs between conservation values and discernment ability, we considered Haerter's (2025) proposal that people who focus on self-protective and avoidant values may be more vulnerable to conspiratorial views. Consistently, our results suggest that individuals' need for security and stability is associated with threat-focused cognitive styles and defensive motives, such as conspiratorial beliefs, which in turn reduce discernment ability. This partial mediational pathway points to the epistemic and existential purpose of conspiracy beliefs as mechanisms of managing uncertainty and threat (e.g., van Prooijen & Douglas, 2017). Since the relationship between self-transcendence values and discernment was not mediated by conspiracy beliefs, our

findings suggest that different motivational systems may operate through distinct cognitive processes. For example, contrary to conservation values, self-transcendence values may activate prosocial motives rather than defensive motives, protecting from engagement with misinformation.

This study's results showed no significant effects on discernment ability for factors such as education or time spent online. Although previous studies have shown mixed results on the impact of education (Enders et al., 2023; Hwang & Jeong, 2021; Sebalo et al., 2023), our study suggests that, at least among middle-aged individuals (Generation X), education does not significantly affect discernment ability. Similar results were also found for time spent online, suggesting that certain risk factors that may apply to younger generations (Kops et al., 2025; Selnes, 2024) are not observed in the 45-65 European citizen subgroup. Taking these findings together, we see evidence that formal education and online habits may not be sufficiently protective against misinformation (e.g., Imhoff et al., 2022). This finding aligns well with Piccolo et al.'s (2020) proposal of a multilayered model of addressing misinformation where informal (individual level), technical, and formal (policy level) layers interact and need to be considered in misinformation prevention.

## Implications

This study delivers a distinctive contribution to the literature on values and misinformation discernment but focusing on an underresearched and highly influential group of participants, that of the middle-aged members of European society. The study's findings extend previous work in this area by replicating findings observed in smaller or nationally limited samples that value orientations predict both increased conspiratorial beliefs and misinformation discernment ability across three current and contested socio-scientific topics (immigration, vaccination safety, climate change). Furthermore, the finding that conservation values are associated with increased vulnerability to conspiratorial beliefs and lower discernment ability points to important implications for the European online media environment. Given that conservation-oriented values such as security and tradition tend to be more salient in periods of societal uncertainty, economic instability or cultural changes, where they function as means of coping with perceived threat, misinformation interventions will need to move beyond educational formats such as media literacy and address the emotional and motivational functions served by conspiratorial and misinformation narratives. This might mean that corrective or accurate information may need to be framed or connected with value priorities of message recipients, rather than solely appealing to factual accuracy (e.g., Christodoulou et al., 2024). Moreover, stemming from the

positive relation between self-transcendence values and greater discernment, our findings suggest that future efforts should invest in promoting open-mindedness and the ability to entertain multiple perspectives, for example through argument-based interventions (Iordanou & Fotiou, 2025; Iordanou et al., 2025).

## Limitations and Future Directions

The study acknowledges several limitations. First, the design of the survey is cross-sectional, therefore preventing causal interpretation. Although the findings of the mediation analysis align with Schwartz's (1992) theoretical framework, the directionality among values and conspiracy beliefs cannot be proven, suggesting that experimental value-framing designs or longitudinal studies may be appropriate. Second, the samples recruited across four languages, as well as the countries that participated in the study, were not identical in size, introducing the likelihood of data from certain national contexts contributing more heavily to the outcomes. Third, although the discernment test was carefully designed and based on information retrieved from official fact-checking sites, the presentation format was not in the naturalistic setting of a social media platform, and the content of the posts may have had different levels of publicity and public interest in the various participating countries, thus affecting participants' reactions. Future studies may consider the possibility of choosing topics that also consider national publicity. Finally, not all questionnaires used were previously validated in the languages included in the study. Longer versions of the tools were used for linguistic accuracy, supported by rigorous translation and piloting, and factor analysis of the resulting data to ascertain cross-language accuracy.

## Conclusions

This study focused on the relationship among personal values, conspiratorial beliefs, and misinformation discernment on three socio-scientific topics, focusing on middle-aged European citizens. The findings indicate that motivational value orientations have a role to play in influencing how citizens engage and select information presented on social and online media platforms. The vulnerability associated with conservation values indicates that self-protective motivations, such as a preference for stability and security, may be more aligned with conspiratorial reasoning, while self-transcendence values, through a likely emphasis on pro-social motivation, have a protective role in engagement with information. This study strongly suggests that information interventions aiming to tackle misinformation will benefit from acknowledging and working with citizens' underlying

value motivations in the design of counter-messages and other educational programs. Future work can examine the observed pathways using longitudinal designs or introduce value-framing in countermessage interventions to examine their impact.

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## Open Science

This study was preregistered on the Open Science Framework (Christodoulou & Iordanou, 2024), including a detailed description of a larger project's aims, materials, variables, hypotheses, and planned analyses. This article reports a subset of the data and analyses from that preregistered study.

## Open Data

The data are not openly accessible but are available upon reasonable request from the corresponding author.

## Open Materials

Study materials are available anonymously at [https://osf.io/rpn27/overview?view\\_only=2682d5eb78d74dd6ae26c0d1-ba34e540](https://osf.io/rpn27/overview?view_only=2682d5eb78d74dd6ae26c0d1-ba34e540)

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