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Investigating perceived trust and utility of balanced news chatbots among individuals with varying conspiracy beliefs

Shreya Dubey [a,*], Paul E. Ketelaar [b,**], Tilman Dingler [c], Hannah K. Peetz [b], Hein T. van Schie [b]

[a] Amsterdam School of Communication Research, University of Amsterdam, the Kingdom of the Netherlands
[b] Behavioural Science Institute, Radboud University, the Kingdom of the Netherlands
[c] Department of Sustainable Design Engineering, Delft University of Technology, the Kingdom of the Netherlands

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ABSTRACT

In the current media landscape, various ideas and narratives gain traction, influenced by the dynamics of selective exposure and a decline in trust in traditional information sources. This trend holds the potential to cultivate polarisation of perspectives, as individuals actively seek information that resonates with their existing attitudes. Hence, diversifying information that is available online can encourage users to engage with multiple perspectives, especially when provided by a trustworthy source. This paper presents findings from two studies which compared individuals with a higher belief in generic conspiracy theories (Study 1; $n = 84$) and specific conspiracy beliefs on climate change (Study 2; $n = 23$) to those with lower conspiracy beliefs ($n_{study\ 1} = 93$; $n_{study\ 2} = 35$) on perceived trustworthiness and usefulness of the so called 'balanced news chatbots'. These chatbots present a selection of opposing alternative and mainstream perspectives on topics of societal divide like climate change. We found that participants from both groups responded positively to the balanced news chatbot. Trust and perceived usefulness were identified to be key indicators of a positive attitude towards and high intentions of using such a chatbot, corroborating the acceptance of balanced news chatbots as a potential tool to reduce polarisation and conflict, piercing existing information bubbles. In both studies we also found that participants with higher conspiratorial beliefs responded even more positively to the balanced news chatbot than individuals with lower conspiratorial beliefs. We conclude that balanced chatbots are promising as a trusted source of diversified information for individuals with varying levels of conspiracy beliefs.

Conspiracy theories are increasingly noted as fuelling the distrust in science and the rule-based order underlying democracy including policies on topics such as climate change and health (Jolley et al., 2022). Balanced news chatbots and similar tools (Tabrizi & Shakery, 2019), could provide effective means to penetrate information bubbles of conspiracy theorists or individuals entrenched in limiting ideological systems (Sutton & Douglas, 2020). In the present research we (1) investigated the main factors that contribute to the acceptance and use of balanced news chatbots based on the Technology Acceptance Model (TAM), and (2) investigated differences among individuals with higher and lower conspiracy beliefs in their appreciation and projected use of balanced news chatbots in the domain of climate change.

1. Balanced news chatbots

Recent work has focused on training chatbots to become conversational partners on controversial issues. Dingler and colleagues (2018, pp. 1664–1668) have suggested the use of biased bots to "invite users to reflect on their views, acquire and advance media literacy and critical thinking skills, and subsequently contribute to a more informed public discourse and depolarization" (p. 1667). Chatbots are automated conversational agents that simulate a conversation in natural language via text input and automatic text output in real-time (McTear et al., 2016). Inviting users to browse diverse information with the help of an objective conversational agent could motivate them to consider this information. Accordingly, chatbots can be used to present selections of news items from varied sources to increase the chances of exposure to

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* Corresponding author.
** Corresponding author.
E-mail addresses: s.dubey3@uva.nl (S. Dubey), paul.ketelaar@ru.nl (P.E. Ketelaar).

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differing viewpoints, especially among users who may be prone to only viewing attitude congruent information online (Jones & Jones, 2021; Sánchez-Gonzales & Sánchez-González, 2020; Zarouali et al., 2021).

Chatbots also have certain distinct advantages in the digital landscape. Users may be motivated to use chatbots for their pragmatic uses, such as efficiency and convenience (Følstad & Brandtzaeg, 2020). Moreover, their 24-h availability and instant responses make them easy to use. Studies have also found that users place more trust in computerized systems when compared to humans, as automated agents may be perceived as more rational and objective, or machine-like (Seeger & Heinzl, 2018; Sundar & Kim, 2019, pp. 1–9). Thus, 'balanced chatbots' or news chatbots that offer information from a varied selection of sources may prove to be trustworthy among audiences to disseminate various and even opposing perspectives on critical and divisive societal issues, like climate change.

However, previous research on responses to information that is conflicting with people's existing beliefs shows that especially in online contexts, individuals are more likely to engage with attitude congruent information and react to attitude incongruent information negatively (Jacobson et al., 2016; Schwind et al., 2012; Stall & Petrocelli, 2023). In a study about news preferences on Facebook, Jacobson and colleagues (2016) found that people preferred partisan (one-sided) news sources that reflected their own ideologies and preferred conversing within groups sharing their own beliefs (confirmation bias), thereby reducing the chances of coming into contact with information disconfirming their opinions. This segregation is common in online environments and can lead to further amplification of pre-existing beliefs, making them harder to change (Heatherly et al., 2017; Tabrizi & Shakery, 2019).

Furthermore, when faced with information that contradicts existing beliefs, individuals can react defensively and even develop a distrust of certain media outlets and individuals. Research posits that this could be because contradictory information may threaten people and make them uncomfortable (Steele & Liu, 1981). People may also believe that they have formed their opinions in an objective and unbiased manner and therefore do not need to engage with opposing views (Pronin et al., 2004). In a study aimed to reconcile these perspectives Minson and Dorison (2022) found the latter to be a more fitting explanation for why people avoid opposing views – i.e., people like to believe that their opinions are objectively formed, and thus do not engage with information opposing their existing views.

1.1. Chatbots as a tool to pierce information bubbles

Strong beliefs formed on a preference for attitude congruent information while avoiding attitude incongruent information can undermine individual and political action, as in the case of climate change. For example, while general belief in anthropogenic climate change is increasing among the public, conspiratorial narratives on the issue also persist (Ayers et al., 2024). As such, belief in climate change related conspiracy theories has been linked with reduced intentions to decrease carbon footprint, vote, or even participate in political processes altogether (Jolley & Douglas, 2014). Conspiracist ideation in general is also related to the rejection and mistrust of science (Lewandowsky et al., 2013). Diversifying information can be especially important for individuals with a high conspiratorial ideation, who may be particularly vulnerable to seeking information aligning with their pre-existing attitudes due to motivated reasoning (Miller et al., 2016).

To counter this tendency for seeking attitude congruent information, we invited two groups of participants – those likely to believe in conspiracy theories (individuals with higher conspiracy beliefs) and those unlikely to do so (individuals with lower conspiracy beliefs) – to browse diverse news articles with the help of an objective conversational agent with the goal of motivating them to consider information contrary to their beliefs. We examined their evaluations of the chatbot by adapting the technology acceptance model (TAM), allowing us to determine the extent to which factors like trust and perceived risks, among others, could predict users' attitudes and intention to use a balanced news chatbot in the future.

1.2. Factors influencing the acceptance of news chatbots

Several factors determine the uptake of new technology by users. User attitudes towards new technologies like a balanced news chatbot are a key predictor of user acceptance and behavioural intention to use them (Davis, 1989). The vast body of literature on the technology acceptance model (TAM), based on the theory of reasoned action, suggests that the behavioural intention to use new technology is influenced by the user attitude towards that technology. According to TAM, when presented with new technology, users may form general impressions of the technology based on its perceived ease of use, perceived usefulness, perceived risks, and trust in the technology (Davis, 1989; Pavlou, 2003). These four constructs can be defined as follows: Perceived ease of use can be described as "the degree to which a person believes that using a particular system would be free from effort" (Davis, 1989, p. 320). In the case of chatbots, this means how easy it is to use the chatbot and whether the interface is accessible or not. Perceived usefulness can be defined as "the degree to which a person believes that using a particular system would enhance his or her job performance," i.e., productivity (Davis, 1989, p. 320). For chatbots, this translates to whether or not individuals perceive news chatbots to be useful as sources of news and other information. Perceived risk can be defined as the likelihood of an undesirable outcome, reflecting behavioural and environmental uncertainties such as unpredictable behaviour of trading partners or the unreliable nature of the internet more generally (Pavlou, 2003). In the context of chatbots this may translate to privacy concerns, personal risks (because of potentially misleading information etc.), or performance risks (receiving an incorrect response). Finally, online trust is defined as "an attitude of confident expectation in an online situation of risk that one's vulnerabilities will not be exploited" (Corritore and colleagues, 2003). In the context of balanced news chatbots this may translate to trust in the impartiality of an objective artificial agent that is delivering information from multiple ideological perspectives.

1.3. Present research

As stated at the onset, our research aimed to investigate the main factors that determine the acceptance and use of balanced news chatbots, and potential disparities in the acceptance of these bots among groups exhibiting substantial differences in their beliefs on topics of societal concern such as climate change. As an extreme test of the possible acceptance of balanced news chatbots we chose a group of individuals who commonly identify as conspiracy theorists. This group is known for embracing opposing perspectives on contemporary issues like climate change (Uscinski et al., 2017). In contrast, we juxtaposed them with a group of so-called mainstreamers, or individuals who adhere to the prevailing belief that climate change is scientifically established. This approach allowed us to explore acceptance variations among groups with distinct beliefs. We hypothesized that individuals with strong conspiratorial beliefs will exhibit lower trust, a less favourable attitude, and lower inclination to use balanced news chatbots following research that has found that conspiratorial thinking correlates with heightened distrust (Frenken & Imhoff, 2023), scepticism toward science (Lewandowsky et al., 2013), and defensive reactions to viewpoints that contradict their perspective (Abalakina-Paap et al., 1999; Compton et al., 2021; Miller et al., 2016).

We report on two studies, both involving individuals with higher and lower conspiracy beliefs. In Study 1 we invited a group of individuals with a strong generic conspiracy belief across multiple domains (e.g. climate, health, politics). Generic conspiracy beliefs constitute a "general view of the world as determined by malicious plots hatched in secret (Imhoff et al., 2022, p. 1)". In Study 2 we invited a group of individuals who endorse specific conspiratorial beliefs in in the domain of climate

change. While closely linked, generic conspiracy belief and specific conspiracy beliefs differ in how stable they are over time – generic conspiracy belief is regarded as a more stable individual disposition than specific conspiracy beliefs, which may overlap with or emerge from other ideological beliefs like an in-group bias (Imhoff et al., 2022).

Hence, the present research evaluated and compared user attitudes and acceptance of a balanced news chatbot to two groups of users, individuals with higher and lower conspiracy beliefs. The chatbot allowed users to choose from an equal number of article headlines containing either mainstream or alternative information on the topic of climate change. Based on their selection, users could read a summary of their preferred articles, and their selection would provide insights into how users interact with attitude (in)congruent information online. Following their interaction with the balanced news chatbot, participants were asked to evaluate their experience.

2. Study 1

2.1. Hypotheses

H1. User attitudes towards balanced chatbots are determined by perceived ease of use (1a), perceived usefulness (1b), perceived risks (1c), and trust in chatbots (1d).

H2. Individuals with higher generic conspiracy belief show less trust in balanced chatbots as an information source than individuals with lower generic conspiracy belief.

H3. Individuals with higher generic conspiracy beliefs show a less favourable attitude towards balanced chatbots (3a) and lower intention to use these chatbots as an information source (3b) as compared to individuals with lower generic conspiracy beliefs.

H4. Attitude towards balanced chatbots predicts intention to use chatbots.

2.2. Method

The hypotheses (except H4), power analysis, sampling procedure, planned analysis and exclusion criteria of the participants were preregistered on the Open Science Framework (OSF) prior to data collection. The study was reviewed by the Ethics Committee, Faculty of Social Sciences, Radboud University (Ref No. *ECSW-2020-001*). All study materials are available on OSF project page.

2.3. Participants

The sample size in our study was calculated to be at least 127 participants based on several recommendations for a-priori power analysis in statistical equation modelling (SEM) analysis (Hair et al., 1995; Pallant, 2020). A total of 311 participants[1] were recruited by DVJ Insights (Utrecht, the Netherlands), a research firm that specializes in representative internet surveys, using a contractually agreed sampling plan. Participants were members of a representative panel of more than 15 million U.S. residents (as of January 1, 2020), who were invited according to a representative criterion for approximation with the distribution for age and gender. Complete information about the panel is included in the supplementary materials (Tables A1 and A2).

In accordance with the preregistered exclusion criteria, participants who took more than 30 min or less than 5 min to complete the survey, read less than 4 news articles, or spent less than 20 s on the chatbot were removed before analysing the data. The exclusion rate of the participants was quite high, but using stringent criteria ensured that participants had sufficiently interacted with the chatbot before evaluating it. Individuals were grouped as those with a higher conspiracy beliefs and lower conspiracy beliefs based on their scores on the Generic Conspiracist Beliefs Scale (GCBS; Brotherton et al., 2013). The final sample for data analysis consisted of $N = 177$ participants (49 % female, 1 % other), including 93 individuals with low generic conspiracy ideation (average GCBS score below 2) and 84 individuals with high generic conspiracy ideation (average GCBS score above 4). Most participants were aged between 26 and 40 years (28 %) and 56–70 years (28 %), followed by 41–55 years (24 %), 18–25 years (11 %) and above 70 years (9 %).

2.4. Materials

We developed a chatbot named 'Infobot' for the present study (Fig. 1). This chatbot was able to assist users in browsing news items and obtaining a quick summary of the articles. 'Infobot' presented a selection of 8 news articles about climate change in random order. This was done to present a balanced selection of both perspectives and maintain uniformity in the news topic. All article headlines were presented randomly in a carousel such that participants could scroll across to view all the headlines before making the choice to click and read the article. In the carousel, participants could see two randomised article headlines (irrespective of the device used), and clear arrows which allowed them to scroll back and forth through the articles. After the user clicked on a specific headline to obtain a summary, that headline was removed from the array for the next presentation. This was done until the user had read at least 4 news articles.

Four news article headlines contained mainstream perspectives on climate change and four contained alternative perspectives on climate change. In the set of alternative articles, two articles directly qualify as conspiratorial by referring to a secret agenda or plot by a powerful group of people, while two others opposed climate change alarmism. From a laymen's perspective, however, all four articles qualify as conspiratorial as the term is colloquially used to refer to views that are dissenting from the mainstream narrative (Brotherton & French, 2014; Cassam, 2019; Napolitano & Reuter, 2023). From the article headlines, participants could judge whether a news article presented a mainstream (pro climate action) or alternative (anti climate action) information. As soon as the participants clicked on a headline of their choice, a summary of the news article was presented by the chatbot. All articles were directly adapted from recent real news stories.

The chatbot was implemented using Rasa (https://rasa.com/), an open-source bot framework that contains a natural language understanding component and allows for tracking conversations. The chatbot was able to keep track of the articles that were already read by users and removed these articles from the carousel as the user progressed. The chatbot was implemented using HTML, CSS, and JavaScript and we particularly focused on providing a user-friendly interface.

2.5. Procedure

The survey was administered using Qualtrics survey software. Since the study was online, all the instructions were provided textually. The participants were informed that the goal of the study was to rate the user experience of interacting with news chatbots. There were three parts in the study – a pre-screening measure to select individuals with low- and high-conspiracy beliefs, interaction with the balanced chatbot, and measures to evaluate attitudes towards and behavioural intention to use the chatbot. After providing informed consent, participants first filled out pre-screening questions about their internet use and belief in conspiracy theories. The participants who did not use internet to obtain news were informed that they were not eligible to participate in the

[1] A moderate to high proportion of respondents was anticipated to drop out before completing the full procedure or to fail to meet the criteria for sufficient interaction with the chatbot. To ensure the required sample size was met and to mitigate the need for additional recruitment at a later stage, we proactively included a larger initial pool of participants.

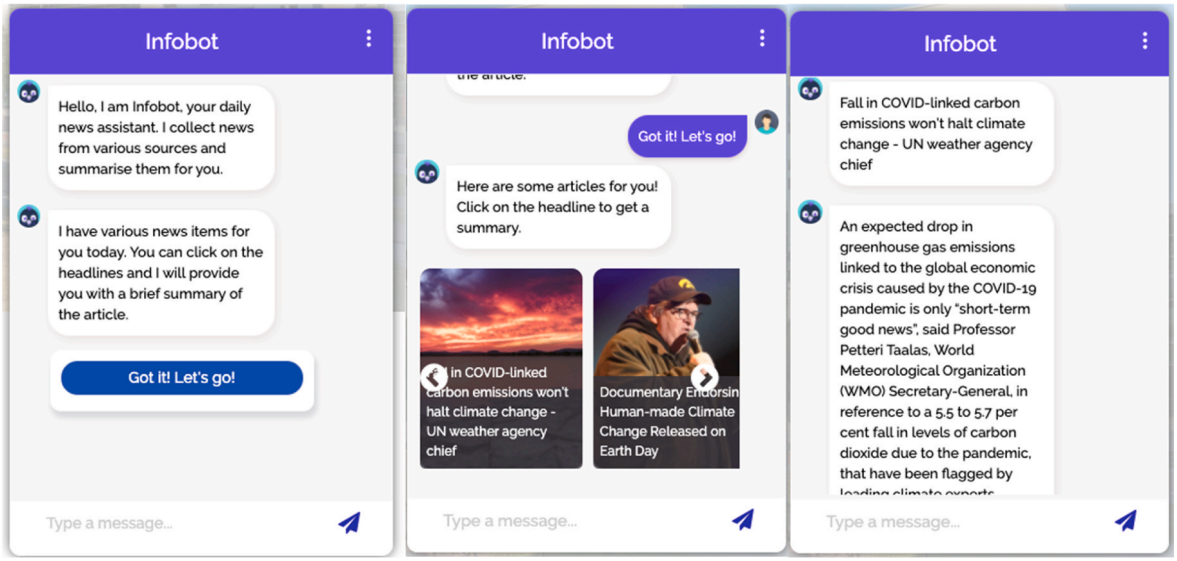

Fig. 1. Infobot – News chatbot
Note. The chatbot presented eight title pages of news articles on the topic of climate change. Participants could scan the article titles pages by clicking on the white arrowheads (middle panel) to move the array to the left or to the right.

study further. Those who met the criteria for the study proceeded to the second phase where they were given the following information about chatbots before interacting with 'Infobot' by clicking on a link that opened in an external website with the following information:

> "Chatbots have emerged as convenient assistants to help users in browsing news. Such news chatbots are automated software applications designed to present a balanced selection of news items to consumers. An advantage of using news chatbots is that they present a wide range of news articles, from a variety of sources. The goal of the current study is to rate the user experience of interacting with a news chatbot."

Before interacting with the chatbot, the participants were also instructed that they would only be able to return to the survey to answer the remaining questions after reading 4 headline summaries (half of all news headlines presented). On reaching the website containing the chatbot, participants were greeted by the chatbot which informed them that they could browse some news headlines and obtain a summary for any headline of their choice by clicking on the headline. Each time the participants selected a headline to read its summary, the chatbot excluded that article from the next random sequence of articles which were presented in the carousel. To ensure that participants read the instructions and interacted with the chatbot optimally, i.e., selected at least 4 news headlines and read their summaries, we excluded participants who spent less than 20 s reading the instructions and those who clicked on less than 4 headlines.

After the participants had clicked through the required number of articles, the chatbot instructed them to return to the survey. In this third and final part of the survey, participants rated Infobot's perceived ease of use, perceived usefulness, perceived risks, and trustworthiness. The participants also indicated their attitudes towards the chatbot, as well as their intention to use the chatbot in the future. Finally, the participants provided demographic information. An open-ended question at the end of the survey checked participant's awareness of the objectives of the study. Before making the final submission, participants were debriefed about the goal of the study and thanked for their participation. Participants took approximately 15 min to complete the survey and were reimbursed €2 for their participation (€8/hour).

2.6. Measures

Internet Use. A single item measured the extent to which participants used the internet to read news on a 5-point scale ranging from *Never* (1), *Rarely, A few times a month, A few times a week, Every day or almost every day* (5).

Conspiracist Ideation. Conspiracist ideation was measured by using the Generic Conspiracist Beliefs Scale (GCBS; Brotherton et al., 2013). This 15-item scale consists of five facets: "belief in routine governmental malfeasance; belief in the existence of malevolent global conspiracies; belief in the existence and cover-up of extra-terrestrials; concerns over the unethical control of information; and belief in conspiracies infringing on personal well-being and liberty" (Brotherton et al., 2013, pp. 11–12). Responses were scored on a 5-point scale ranging from *Definitely not true* (1) to *Definitely true* (5). The average score of college students on this scale is 2.22 (Brotherton et al., 2013). Higher scores indicate greater conspiracist ideation.

Perceived Ease of Use & Perceived Usefulness. Perceived ease of use of the chatbot was assessed by four items adapted from previous studies (Corritore et al., 2003; Davis, 1989). The measure included statements such as "The chatbot is easy to use." Perceived usefulness was also measured through a 4-item scale adapted from Davis (1989), which includes items such as "I feel that by using chatbots like this I can access news more quickly." All items were scored using a 7-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (7). Higher scores indicate higher perceived ease of use and perceived usefulness.

Trust & Perceived Risks. Perceived risks of and trust in the chatbot were assessed by using seven items (3 items for perceived risks and 4 items for trust) adapted from previous studies (Corritore et al., 2003; Jian et al., 2000) on a 7-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (7). An example statement from the measure of the perceived risk is "I feel I must be cautious when using this chatbot." whereas an example statement from the trust measure is "I believe that this chatbot is trustworthy." Higher scores indicate greater trust and higher perceived risks from the chatbot.

Attitude towards chatbot. Attitude towards chatbot was measured by a three-item scale adapted from van Eeuwen (2017), scored on a 7-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (7). An example statement from the attitude measure is "Overall, I feel that using a news chatbot is beneficial." Higher scores indicate a more positive attitude towards the chatbot.

Intention to use chatbot. The intention to use chatbots was measured using four items that were adapted from previous studies (Venkatesh et al., 2003; Zarmpou et al., 2012) and scored on a 7-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (7). An example statement from the behavioural intention measure is "If I have access to a chatbot like this, I will use it to read the news." Higher scores indicate a greater behavioural intention to use the chatbot.

Demographic information. The demographic information obtained from the participants consisted of age, gender, and highest completed level of education. Furthermore, Left-Right political orientation was measured on an 11-point scale from *Extremely liberal* (0) to *Extremely conservative* (10) by following Kroh's (2007) recommended response format for measuring left-right political orientation. Belief in anthropomorphic climate change was measured using a single item "Please indicate the extent to which you agree with the following statement: Human emissions and activities have caused global warming." scored on a 7-point Likert scale ranging from *Strongly disagree* (1) to *Strongly agree* (7).

2.7. Results

Structural equation modelling (SEM) and independent samples *t*-tests were conducted using the R statistical software (R Core Team, 2021) to evaluate the hypotheses. Reliability estimates (Cronbach's α) for all measures are reported in the supplementary materials (Table C).

2.7.1. Structural equation model

The hypothesized model was estimated by structural equation modelling (SEM) analysis using lavaan package (Rosseel, 2011) in R. Table 1 presents the descriptive statistics and bivariate Spearman correlations between variables included in this study. The model was estimated using the two-step approach which involves specifying both measurement and structural models.

To account for the univariate and multivariate non-normality and outliers, a robust estimator to calculate the scaled ML test statistic was used to estimate the models in accordance with Ullman's (2006) recommendations for medium sample sizes (over 120 participants). The model fit was evaluated, and robust fit indices were reported according to Kline's (2016, p. 534) recommendations to report the chi-square statistic, comparative fit index (CFI), Root Mean Square Error of Approximation (RMSEA), and Standardised Root Mean Square Residual (SRMR). CFI values greater than .95 (Hu & Bentler, 1999), SRMR values less than .08 (Hu & Bentler, 1999), and RMSEA values less than .07 (Steiger, 2007) indicate an adequately fitting model.

Measurement model. First, a measurement model was specified to describe the relationship between observed scale items and their underlying latent constructs. Each variable of interest, namely, perceived ease of use, perceived usefulness, perceived risks, trust, attitude towards chatbot, and intentions to use the chatbot in the future was represented by a latent variable estimated from the responses on the corresponding items. This approach is advantageous over other alternative methods such as multiple regression which use composite scores because latent variables are free of measurement error, therefore, none of the estimated effects are attenuated due to measurement error (Coffman & MacCallum, 2005).

Indicators were only allowed to load onto the respective latent variables, and cross-loadings were not specified. Results of this model indicated an inadequate fit for the data; the chi-square was significant $\chi^2(194) = 490.509$, $p < .001$; CFI = .935; RMSEA = .096, 90 % CIs [.085, .107]; SRMR = .078. Modification indices were obtained to improve model fit, which showed that the negatively worded item number 3 "I am suspicious about this chatbot's intentions." from the trust scale was also loading onto the perceived risks construct. To avoid cross-loadings, item 3 of the trust scale was dropped from the analysis and the model was estimated again. The modified model was a good fit for the observed data $\chi^2(174) = 330.148$, $p < .001$; CFI = .964; RMSEA = .074, 90 % CIs [.062, .086]; SRMR = .043, indicating that the scale items measured the hypothesized constructs adequately. All factor loadings were significant, ranging between .70 and .96. Table B1 in the supplementary materials the standardized loadings of each item on its corresponding construct as estimated by the measurement model. This measurement model formed the basis of the structural model to test the hypotheses of the present study.

Structural model. A structural model was specified to test the hypothesized relationships between the latent variables. Regression paths describing perceived ease of use, perceived usefulness, perceived risks, and trust in chatbots as predictors of attitudes towards chatbots were specified. Additionally, behavioural intention was regressed on to user attitudes towards the chatbot. As shown in Fig. 2, the model provided a good fit to the data, $\chi^2(178) = 344.289$, $p < .001$; CFI = .962; RMSEA = .075, 90 % CIs [.063, .087]; SRMR = .044.

SEM analysis indicated that the predictors explained 91 % of the variance ($R^2 = .913$) in attitudes towards chatbots, and this attitude accounted for 96 % of the variance in behavioural intention to use chatbots ($R^2 = .964$). Inspection of the individual regression pathways showed that perceived usefulness ($\beta = .64$, $p < .001$) and trust ($\beta = .35$, $p < .001$) were significant determinants of attitude towards chatbots. However, contrary to expectations, perceived ease of use ($\beta = .00$, $p = .90$) and perceived risks ($\beta = -.06$, $p = .07$) did not seem to directly affect attitude. Thus, hypotheses 1b and 1d were accepted while the structural model showed no support for hypotheses 1a and 1c. Finally, attitude significantly predicted intention to use chatbots in the future ($\beta = .98$, $p < .001$), thereby confirming hypothesis 4.

2.7.2. Differences between individuals with lower and higher generic conspiracy beliefs

With regards to age, 8.34 % of individuals with low conspiracy beliefs were between 18 and 25 years; 17.42 % were between 26 and 40,

Table 1
Bivariate correlations between all variables and descriptive statistics.

	1	2	3	4	5	6
1. PEOU	–					
2. PU	.56***	–				
3. PR	−.13	−.21**	–			
4. Trust	.41***	.71***	−.28***	–		
5. Attitude	.52***	.88***	−.30***	.81***	–	
6. Intention	.46***	.89***	−.26***	.78***	.95***	–
Mean	6.40	5.51	4.15	4.91	5.23	4.91
SD	.94	1.56	1.92	1.63	1.73	1.90
Skewness	−3.10	−1.11	−.11	−.50	−.97	−.74
Kurtosis	13.06	.42	−1.19	−.50	.03	−.62

Note. Perceived ease of use has been abbreviated to PEOU, perceived usefulness to PU, and perceived risks to PR.
a. All measures were scaled prior to conducting the analyses.
***$p < .001$, **$p < .01$.

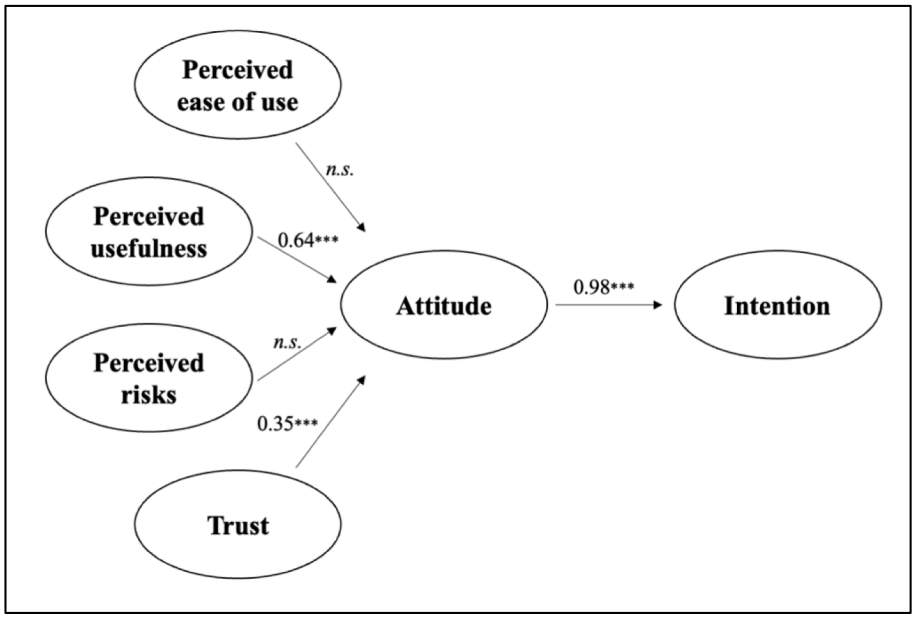

Fig. 2. Structural model showing determinants of attitudes towards and intention to use chatbots
Note. Estimates reflect standardized regression coefficients. $\chi^2(178) = 344.289$, $p < .001$; CFI = .962; RMSEA = .075, 90 % CIs [.063, .087]; SRMR = .044
***$p < .001$; *n.s.* =not significant.

25.76 % were between 41 and 55, 37.12 % were between 56 and 70 and 10.61 % were above 70. Among individuals with high conspiracy beliefs, 9.39 % were between 18 and 25 years; 50.28 % were between 26 and 40, 29.28 % were between 41 and 55, 7.18 % were between 56 and 70 and 3.31 % were above 70 years of age. Welch two-sample *t*-tests were used to account for the assumption of equal variances in the two groups due to their unequal sample sizes. The two groups significantly differed in their political orientation, $t(164.02) = 4.01$, $p < .001$. Participants with higher conspiracy beliefs were more politically conservative ($M = 6.61$, $SD = 3.16$) than those with lower conspiracy beliefs ($M = 4.83$, $SD = 2.70$). Belief in anthropogenic climate change was not found to differ between the two groups however, $t(173.89) = .70$, $p = .48$.

There was a significant difference between the groups on trust in chatbots, $t(174.97) = 4.71$, $p < .001$, but in contradiction to the hypothesized effects. Individuals with higher generic conspiracy beliefs trusted the chatbot more ($M = 5.48$, $SD = 1.44$) compared to those with lower generic conspiracy beliefs ($M = 4.39$, $SD = 1.62$). Based on these results, hypothesis 2 was rejected (Fig. 3a).

The two groups also differed on attitude towards the chatbot $t(172.81) = 6.09$, $p < .001$. Individuals with higher conspiracy beliefs

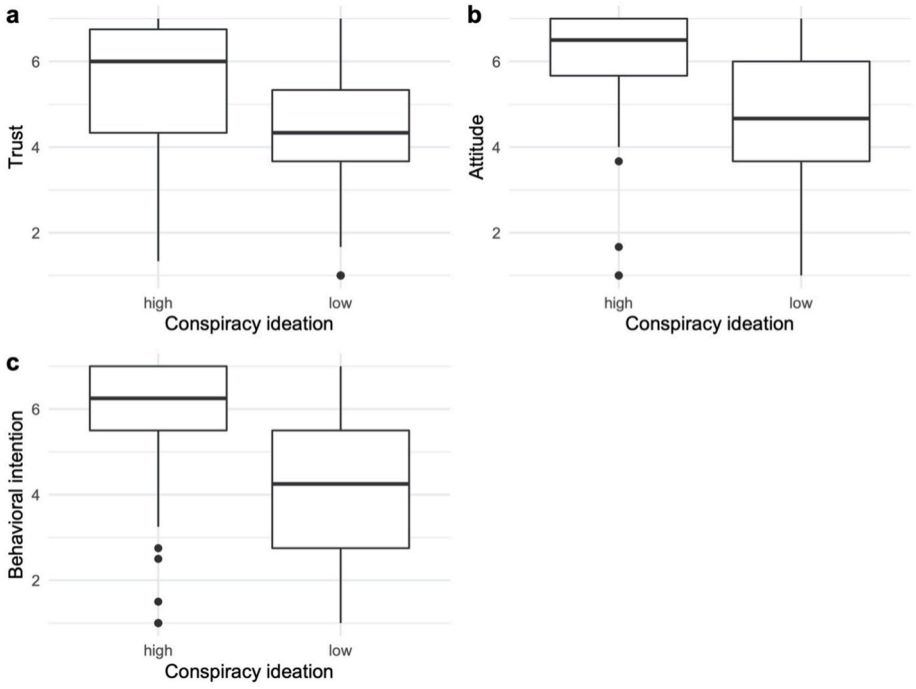

Fig. 3. Box plots showing differences between individuals with low and high conspiracy beliefs
Note. Mean differences in (a) trust in chatbot, (b) attitudes towards chatbot, (c) behavioural intention to use chatbots.

held a more positive attitude towards the chatbot ($M = 5.98$, $SD = 1.39$) than individuals with lower conspiracy beliefs ($M = 4.55$, $SD = 1.72$). Differences in the intention to use the chatbot were also significant $t(172.58) = 7.28$, $p < .001$, with individuals with higher conspiracy beliefs expressing a greater intention to use the chatbot ($M = 5.86$, $SD = 1.47$) than those with lower conspiracy beliefs ($M = 4.05$, $SD = 1.84$). Thus, hypotheses 3a and 3b were rejected as well (Fig. 3b and c).

Exploratory analyses were conducted to examine the reading patterns and preferences of users. Overall, participants read more articles containing mainstream perspectives on climate change ($n = 395$) than articles containing alternative perspectives ($n = 315$). Welch two-sample t-test found no difference between individuals with high and low generic conspiracy beliefs in their preference for mainstream and alternative news articles, $t(167.17) = -.69$, $p = .49$. Individuals with lower conspiracy beliefs read a total of 373 articles (211 containing mainstream and 162 containing alternative perspectives) while individuals with higher conspiracy beliefs read a total of 337 articles (184 containing mainstream and 153 containing alternative viewpoints). An analysis of covariance (ANCOVA) indicated that the difference in preference for mainstream versus alternative news articles between individuals with high and low generic conspiracy beliefs remained non-significant, even when belief in climate change was included as a moderating variable, $F(1,173) = .018$, $p = .78$.

Average time spent reading each article (in seconds) was obtained for the first three articles selected by each user. It was not possible to obtain reading time for all four articles because the carousel offered no subsequent action that could be timed after users read the final article. Fig. 4 indicates the mean reading times of individuals with lower and higher beliefs in conspiracy theories for mainstream (pro climate) and alternative (anti climate) articles. Independent samples t-test revealed significant differences in reading times for news articles voicing mainstream and alternative views on climate change, $t(167.12) = 2.78$, $p = .005$, with articles containing mainstream views on climate change being read for a longer duration ($M = 31.84$, $SD = 32.99$) than articles containing alternative perspectives on climate change ($M = 25.79$, $SD = 22.42$).

Independent samples t-tests showed significant differences between individuals with lower and higher conspiracy beliefs for reading times of three particular articles containing mainstream (pro climate) views, i.e. article Mainstream 1, $t(109) = 2.49$, $p = .01$; Mainstream 2, $t(73) = 2.84$, $p = .006$; and Mainstream 3 $t(92) = 4.95$, $p < .001$, as individuals with higher conspiracy beliefs spent less time reading these articles ($M_{mainstream1} = 23.32$, $SD_{mainstream1} = 21.11$; $M_{mainstream2} = 20.78$, $SD_{mainstream2} = 22.34$; $M_{mainstream3} = 12.84$, $SD_{mainstream3} = 11.85$) as compared with individuals with lower conspiracy beliefs ($M_{mainstream1} = 52.11$, $SD_{mainstream1} = 83.79$; $M_{mainstream2} = 35.64$, $SD_{mainstream2} = 22.95$; $M_{mainstream3} = 29.93$, $SD_{mainstream3} = 19.47$). A similar difference was found significant for one alternative (anti climate) article, i.e., Alternative 3, $t(76) = 4.25$, $p < .001$, as individuals with higher conspiracy beliefs again spent less reading time ($M_{alternative3} = 17.96$, $SD_{alternative3} = 11.54$) than individuals with lower conspiracy beliefs ($M_{alternative3} = 34.21$, $SD_{alternative3} = 20.68$).

2.7.3. Summary of findings: study 1

Study 1 generated the following results: First, the structural equation model indicated that perceived usefulness and trust predicted participants' attitudes to the balanced news chatbot, whereas perceived ease of use and perceived risks had no significant effect. Participants' attitude towards the chatbot furthermore predicted the intention to use balanced news chatbots in the future. Second, contrary to expectations, individuals with higher conspiracy beliefs trusted the chatbot more than individuals with lower conspiracy beliefs. The more positive evaluation of the news chatbot moreover extended to individuals with higher conspiracy beliefs general attitude and intention to use similar chatbots in the future. Third, individuals with lower and higher conspiracy beliefs did not show significant differences in their selection of alternative or mainstream articles. And fourth, an analysis of reading times showed that individuals higher conspiracy beliefs spent less time reading three of four mainstream articles and one of four alternative articles.

2.7.4. Replication study

As several findings of Study 1 contradicted our expectations (i.e. more positive evaluations of the chatbot by individuals higher conspiracy beliefs; perceived risk not being a predictor of attitude towards the chatbot), and other results being ambiguous (i.e. differences between groups in the reading times of mainstream and alternative news articles; the effect of perceived usefulness bordering significance) a second study was set up to confirm or disconfirm the findings of Study 1 and resolve ambiguities. Furthermore, we aimed to resolve a possible logical inconsistency in the design of Study 1. More specifically, Study 1 measured belief in conspiracy theories as the propensity for a generic conspiratorial ideation, i.e. individuals who scored highly on believing in a range of conspiracy theories. However, the group of individuals with higher conspiracy beliefs did not differ from individuals with lower conspiracy beliefs in their belief in anthropogenic climate change. One explanation for the positive evaluation of the balanced news chatbot by individuals with higher conspiracy beliefs in Study 1 could be that news messages on climate change were not perceived as counter-attitudinal by this group of participants, who were high in general conspiratorial ideation, but perhaps did not strongly endorse climate change specific conspiracy theories.

In Study 2 we tried to control for this possible confound by inviting participants with clear conspiratorial beliefs surrounding climate change. In our hypotheses for Study 2, we also included the possibility that the findings of Study 1 will replicate with a more specific group of individuals with higher conspiracy beliefs, because individuals with higher generic and specific conspiracy beliefs might well be happy with alternative views receiving more attention and being discussed via balanced news chatbots. Hence, we preregistered two opposing hypotheses, one echoing Study 1, reflecting the theoretical framework that was outlined in the introduction, and one based on the empirical findings in Study 1.

3. Study 2

3.1. Hypotheses

H1.1. Participants with higher climate change conspiracy beliefs will trust balanced chatbots more than participants with lower conspiracy beliefs.

H1.2. Participants with higher climate change conspiracy beliefs will trust balanced chatbots less than participants with lower conspiracy beliefs.

H2. Perceived ease of use (2a), perceived usefulness (2b), perceived risks (2c), and trust in chatbots (2d) will determine participants attitudes regarding balanced news chatbots.

H3.1. The attitude towards chatbots (3.1a) and intention to use chatbots to obtain information in the future (3.1b) will be higher for participants high in climate change conspiracy belief than for participants low in climate change conspiracy belief.

H3.2. The attitude towards chatbots (3.2a) and intention to use chatbots to obtain information in the future (3.2b) will be lower for participants high in climate change conspiracy belief than for participants low in climate change conspiracy belief.

H4. Participants' intention to use chatbots in the future is predicted by their attitude towards chatbots.

3.2. Method

The hypotheses for this study, power analysis, sampling procedure, planned analysis and exclusion criteria of the participants were preregistered on OSF prior to data collection. All study materials are available on OSF project page. The study was reviewed by the Ethics

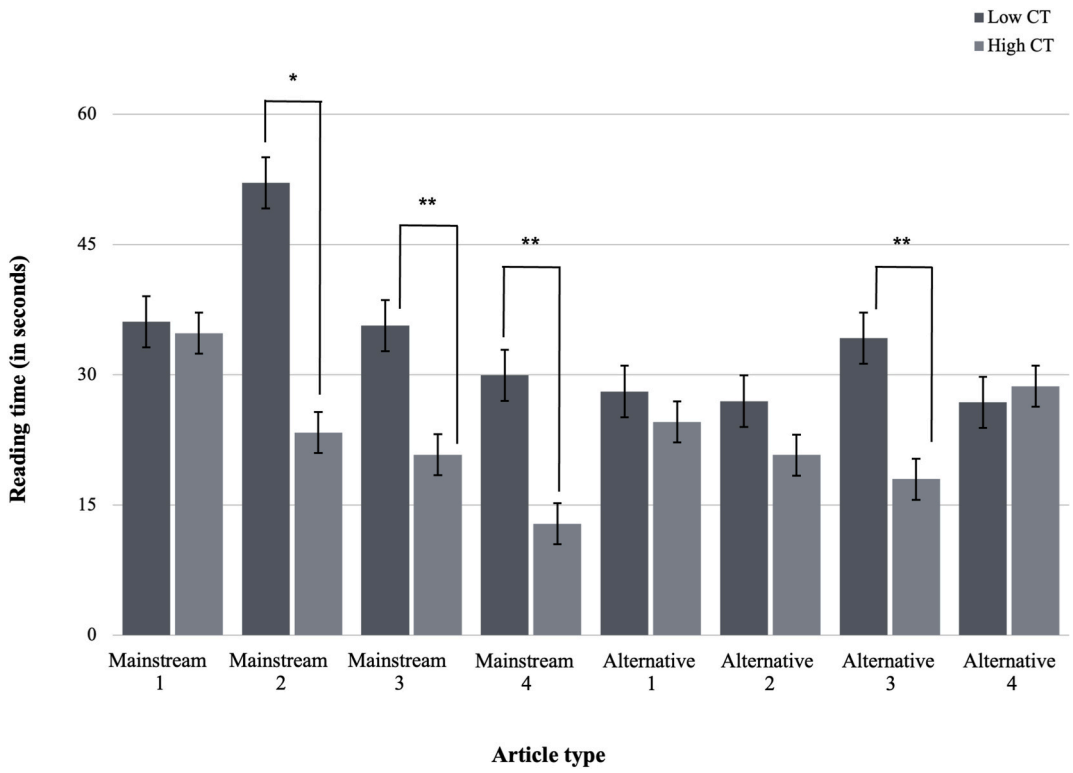

Fig. 4. Reading time per article type (mainstream, alternative) for individuals with lower and higher generic conspiracy beliefs
Note. * denotes $p < .05$; ** denotes $p < .01$ Complete article headlines are reported in the footnote.[21]

Committee, Faculty of Social Sciences, Radboud University (Ref No. *ECSW-2020-001*).

3.3. Participants

We constructed a 4-item measure with a 5-point Likert scale to differentiate participants with low and high conspiracy beliefs specific to climate change (see measures). An average score below 2 meant that participants were assigned to the low conspiracy belief group whereas an average score above 4 led them to be assigned to the high conspiracy belief group. We recruited 176 participants (42 % female, <1 % other) for the second study, and a total of $n = 58$ participants met the inclusion criteria – 35 individuals with low conspiracy beliefs and 23 individuals with high conspiracy beliefs specific to climate change. We would like to note that this smaller sample size (compared to study 1) could have resulted from recruiting individuals with relatively high or relatively low levels of climate change specific conspiracy beliefs, rather than recruiting on generic conspiracy beliefs, which tend to be more prevalent (Walter & Drochon, 2022). Most participants were aged between 26 and 40 years (46 %), followed by 41–55 years (27 %), 56–70 years (18 %), 18–25 years (6 %) and above 70 years (3 %).

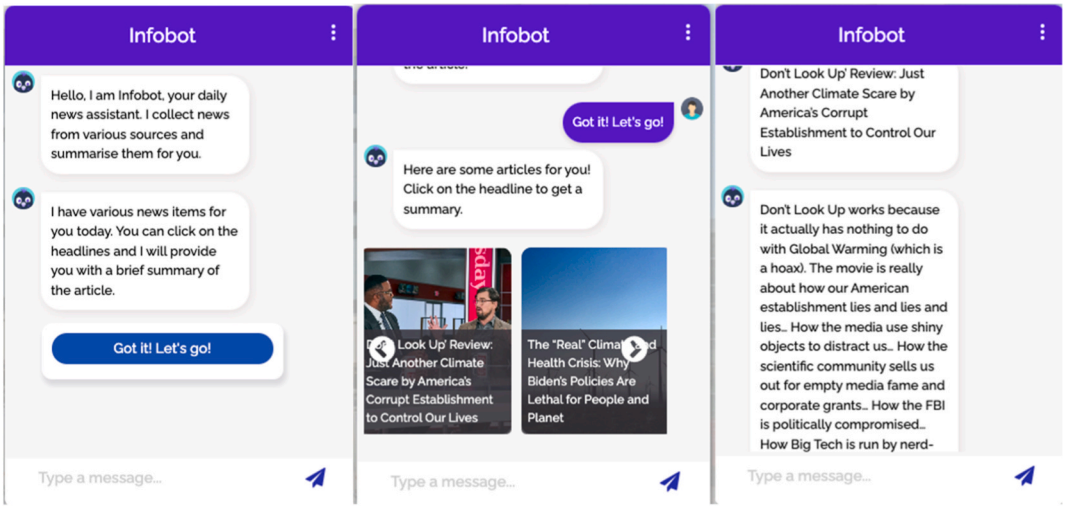

Fig. 5. Infobot – News chatbot
Note. The chatbot presented eight title pages of news articles on the topic of climate change. Participants could scan the article titles pages by clicking on the white arrowheads (middle panel) to move the array to the left or to the right.

3.4. Materials

The infobot developed in Study 1 was also used for Study 2. It was implemented on Rasa and updated with current articles related to climate change, as shown in Fig. 5.

3.5. Procedure

The survey for Study 2 was also administered using Qualtrics. The procedure for Study 2 was similar to the three-part survey used in Study 1, except for two changes. First, the pre-screening measure aimed to select participants who endorsed conspiracy beliefs specifically related to climate change instead of measuring generic conspiratorial ideation. Second, following their interaction with Infobot, participants could only proceed to the next part of the survey when they entered a code provided by the chatbot correctly. This was done to ensure that participants read 4 article summaries and paid attention in their interactions with the chatbot. Participants who did not enter the code correctly were screened out and informed that they failed to complete the study. Participants who entered the code correctly rated Infobot's perceived ease of use, perceived usefulness, perceived risks, and trustworthiness along with their attitude towards and intention to use the chatbot – as in the first study. Before making the final submission, participants were debriefed about the goal of the study and thanked for their participation. Participants took approximately 15 min to complete the survey and were reimbursed €2 for their participation (€8/hour).

3.6. Measures

All the measures in Study 2 were the same as Study 1, except for the measure of belief in climate change related conspiracy theories. The measures for perceived ease of use, perceived usefulness, trust, and perceived risks of the chatbot, as well as attitude towards and intention to use the chatbot were the same as in Study 1.

Belief in climate change conspiracy theories. In Study 1, we measured general conspiratorial ideation, but since Study 2 concerned individuals with conspiracy beliefs specifically about climate change, we used a self-constructed measure comprising 4 items measuring belief in conspiracy theories about climate change. Items included statements such as "The idea that climate change is primarily due to human activities is a hoax or a conspiracy" and "Politicians have a vested interest in changing the facts about climate change." These items were rated on a 5-point scale ranging from *strongly disagree* (1) to *strongly agree* (5). Reliability in the current study was high ($\alpha = .83$). Reliability estimates (Cronbach's α) for all these measures are reported in in the supplementary materials (Table C1).

3.7. Results

Similar to Study 1, we used Structural equation modelling (SEM) and independent samples *t*-tests using the R statistical software (R Core Team, 2021) to evaluate the hypotheses.

3.7.1. Structural equation model

Table 2 presents the descriptive statistics and Spearman correlations between the variables included in the study. We again estimated the proposed model in a two-step approach, specificizing both the measurement and structural models, using a robust estimator to calculate the scaled ML test statistic. Using the same criteria, we evaluated the model fit based on the robust fit indices (CFI >.95; RMSEA <.07; SRMR <.08).

Measurement model. The same initial measurement model of Study 1 was tested. Results of this model indicated an inadequate fit for the data; the chi-square was significant $\chi^2(194) = 430.572$, $p < .001$; CFI = .935; RMSEA = .092, 90 % CIs [.08, .104]; SRMR = .070. Modification indices were obtained to improve model fit, which again showed that the negatively worded item from the trust scale was also loading on the perceived risks construct. We therefore removed the item again. The modified model was an acceptable fit for the observed data $\chi^2(174) = 300.101$, $p < .001$; CFI = .965; RMSEA = .070, 90 % CIs [.057, .075]; SRMR = .035. The model from Study 1 was thus replicated.

All factor loadings were significant, ranging between .78 and .97. Table B1 in the supplementary materials provides the standardized loadings of each item on its corresponding construct as estimated by the measurement model. This measurement model formed the basis of the structural model to test the hypotheses of the present study.

Structural model. Using the measurement model as baseline, we tested the same structural model as in Study 1, including the regression paths from the latent factors perceived ease of use, perceived usefulness, perceived risks, and trust in chatbots as predictors of attitudes towards chatbots (Fig. 6). Additionally, behavioural intention was regressed on attitudes towards the chatbot. This model provided an acceptable model fit, $\chi^2(178) = 305.345$, $p < .001$; CFI = .963; RMSEA = .071, 90 % CIs [.057, .084]; SRMR = .036.

The predictors explained 91 % of the variance ($R^2 = .913$) in attitudes towards chatbots, and this attitude accounted for 94 % of the variance in behavioural intention to use chatbots ($R^2 = .942$). Inspection of the individual regression pathways showed that perceived usefulness ($\beta = .80$, $p < .001$) and trust ($\beta = .40$, $p < .001$) were significant determinants of attitude towards chatbots. Again, perceived ease of use ($\beta = -.25$, $p = .063$) and perceived risks ($\beta = -.02$, $p = .665$) did not seem to directly affect attitude. Finally, attitude significantly predicted intention to use chatbots in the future ($\beta = .97$, $p < .001$). We thus directly replicated the findings of Study 1, confirming H2b, H2d and H4, and not confirming H2a and H2c.

3.7.2. Differences between individuals with lower and higher climate change conspiracy beliefs

With regards to age, 5.7 % of individuals with low conspiracy beliefs were between 18 and 25 years; 57.1 % were between 26 and 40, 11.4 % were between 41 and 55, 17.1 % were between 56 and 70 and 8.6 % were above 70. None of the individuals with high conspiracy beliefs were between 18 and 25 years; whereas 47.8 % were between 26 and 40, 30.4 % were between 41 and 55, 17.4 % were between 56 and 70 and 4.3 % were above 70 years of age. Welch two-tailed independent samples *t*-tests again showed that individuals with higher belief in climate change conspiracy theories were significantly more politically conservative ($M = 8.65$, $SD = 2.62$) than non-believers ($M = 4.97$, $SD = 2.27$), $t(42.342) = -5.51$, $p < .001$. There was also a significant difference between the groups on trust in chatbots, $t(43.487) = -3.81$, $p = .04$. Those with a higher belief in climate change conspiracy trusted the chatbot more ($M = 5.54$, $SD = 1.03$) than those with a lower belief ($M = 4.54$, $SD = .92$). This is a direct replication of the findings from Study 1, thereby confirming H1.1.

The two groups also showed significant differences on attitude towards the chatbot $t(54.882) = -3.24$, $p < .01$. Those with a high belief in climate change conspiracy theories showed more positive attitudes towards the chatbot ($M = 6.25$, $SD = .89$) compared to those with lower conspiracy beliefs ($M = 5.19$, $SD = 1.59$). Also, with regards to the intention to use the chatbot, the groups differed significantly, with those with higher beliefs in climate change conspiracy theories expressing a greater intention to use the chatbot ($M = 6.09$, $SD = 1.30$) than those with a lower belief ($M = 4.91$, $SD = 1.96$), $t(55.986) = -2.76$, $p = .03$. These findings were also in line with Study 1 – H3a and H3b were confirmed.

We planned to conduct analysis of reading patterns and preferences of users to substantiate the exploratory findings of Study 1. Due to an unforeseen malfunction in our online survey, we are unable to provide information about the reading times per news article, but participants' general reading patterns are described. Contrary to Study 1, participants read more articles containing alternative information about climate change ($n = 305$) than articles containing mainstream information ($n = 252$). We found no differences in reading times ($t = 2.78$, $p = .40$) for

Table 2
Bivariate correlations between all variables and descriptive statistics.

	1	2	3	4	5	6
1. PEOU	–					
2. PU	.84***	–				
3. PR	−.27***	−.23**	–			
4. Trust	.62***	.67***	−.08	–		
5. Attitude	.76***	.84***	−.28***	.77***	–	
6. Intention	.70***	.82***	−.23**	.72***	.91***	–
Mean	5.57	5.41	3.78	4.80	5.38	5.28
SD	1.47	1.51	1.87	1.00	1.44	1.59
Skew	−1.27	−1.18	.13	.08	−.97	−.94
Kurtosis	1.01	1.04	−1.11	.41	.49	.12

Note. Perceived ease of use has been abbreviated to PEOU, perceived usefulness to PU, and perceive risks to PR.
a. All measures were scaled prior to conducting the analyses.
$^{**}p < .01$, $^{***}p < .001$.

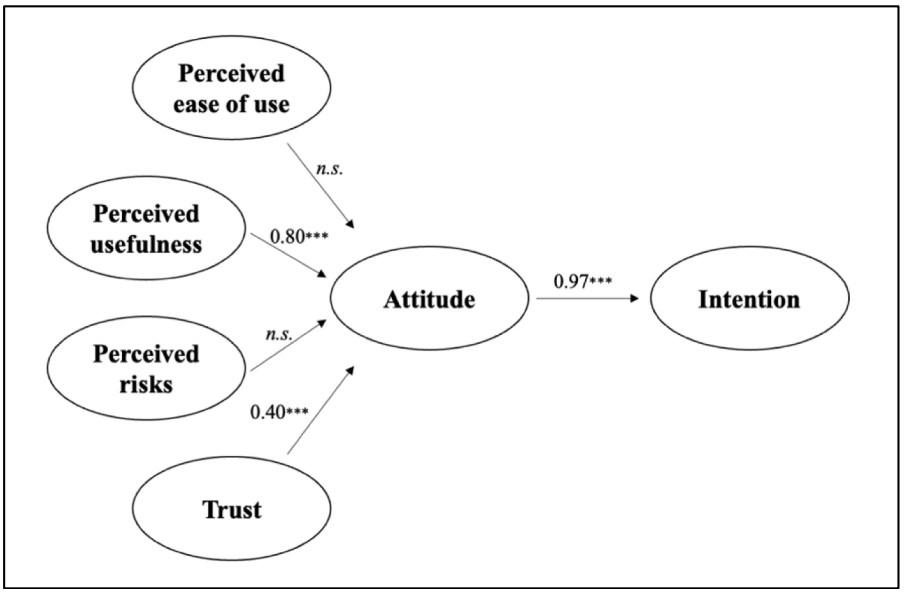

Fig. 6. Structural model showing determinants of attitudes towards and intention to use chatbots
Note. Estimates reflect standardized regression coefficients. $\chi^2(178) = 305.345$, $p < .001$; CFI = .963; RMSEA = .071, 90 % CIs [.057, .084]; SRMR = .036 $^{***}p < .001$; *n.s.* =not significant.

mainstream ($M = 9.90$, $SD = 2.29$) and alternative articles ($M = 10.26$, $SD = 1.50$), also in contradiction to the results of the first study.

3.7.3. Summary of findings: study 2

Findings of study 2 closely replicated the pattern of results of Study 1, as reflected in the following findings. First, similar to study 1, the structural equation model indicated that perceived usefulness and trust predicted participants' attitudes to the balanced news chatbot, while the effect of perceived risk on attitude not playing a significant role as such. Moreover, participants' attitude towards the chatbot predicted the intention to use balanced news chatbots in the future. Third, like in study 1, those with higher conspiracy beliefs (specific conspiratorial beliefs about climate change) trusted the chatbot more than those with lower conspiracy beliefs, had a more positive attitude towards the chatbot, and reported a greater inclination to use balanced news chatbots in the future. Unfortunately, it was not possible to obtain reading preferences and reading times per group, but overall, participants read more alternative news articles than mainstream articles. This was contrary to the findings in study 1.

4. General discussion

Balanced news chatbots offering a broad selection of news articles including opposing perspectives on topics of societal contention could contribute to a more open and inclusive society in which different perspectives can be openly discussed. In the present research we investigated the acceptance of a balanced news chatbot 'Infobot' that presented a selection of news articles containing opposing perspectives on climate change to two groups, individuals with lower and higher conspiracy beliefs. We used the Technology Acceptance Model (Pavlou, 2003; Venkatesh et al., 2003, 2012) to identify the key factors that determine the acceptance and use of these news chatbots as a new technology and compared individuals with lower and higher conspiracy beliefs in their evaluation of the chatbot.

Evaluations of the chatbot indicated that participants responded positively to the balanced news chatbot, those with higher conspiracy beliefs showing greater trust, positive attitude and intention to use the chatbot in the future than those with lower conspiracy beliefs. Trust and perceived usefulness of the chatbot were found to predict users' positive attitude towards the chatbot, which in turn predicted their intention to use the chatbot in the future. These results corroborate the usefulness of TAM in predicting the acceptance of balanced news chatbots by different ideologically motivated groups in our society and suggest key factors that may contribute to the successful introduction of such balanced news chatbots.

4.1. Predicting user attitudes to balanced news chatbots

Across two studies we found that perceived usefulness and trust explained a significant proportion of the variance in participants' attitudes to the news chatbot, while no significant effects were found for perceived ease of use and perceived risks (with the latter bordering significance). These results indicate that perceived usefulness and trust in the news chatbot (and to a lesser extent its perceived ease of use) play a dominant role in shaping people's attitude towards a balanced news chatbot. In other words, our bipartisan sample of participants appreciated the balanced chatbot more if they found the selection of diverse news items helpful and if they trusted the chatbot as a reliable tool. Additionally, attitude towards the chatbot was found to predict the intention to use a similar chatbot in the future which suggests that user acceptance of balanced news chatbots may be optimized by maximizing their perceived usefulness and trust in chatbots. A possible explanation for the absence of a relationship between perceived risks and attitude could be that participants in our studies were recruited from a market research participant panel. That is, these individuals may be used to participating in research studies for monetary incentives, thus potentially overcoming potential risk of privacy issues while participating in the study. Moreover, it is possible that perceived risk and, in particular, perceived ease of use did not emerge as significant predictors of attitudes toward the chatbot because of multicollinearity among these variables. Given the conceptual overlap between constructs in the Technology Acceptance Model, perceived ease of use and perceived risk may share variance with other factors, such as perceived usefulness and trust, reducing their unique predictive power (Lu et al., 2005).

More generally, our application of TAM to the domain of chatbots corroborates previous research that specified the role of trust, perceived usefulness, and (to a lesser extent) perceived ease of use, in determining user attitudes towards new technology and intentions to use it in the future (Davis, 1989; Pavlou, 2003). Furthermore, our results help to extend the research on the TAM to the use of chatbots and confirm the importance of user trust in chatbot usage as reported by previous studies (e.g., Gatzioufa & Saprikis, 2022).

4.2. Attitude differences among individuals with lower and higher conspiracy beliefs

Following previous findings that individuals with higher conspiracy beliefs may be more distrustful and defensive to viewpoints that contradict their perspective (Freeman et al., 2022; Frenken & Imhoff, 2023; Miller et al., 2016), we hypothesized that individuals with higher conspiratorial beliefs would exhibit lower trust in balanced chatbots, will be less positive about and less inclined to use balanced news chatbots in the future. In two consecutive studies involving participants who either showed low or high endorsement of both generic and specific conspiracy theories, we found the opposite pattern of these predicted effects. We found that individuals with higher conspiracy beliefs were more trusting, more positive, and more motivated to use balanced chatbots than those with lower conspiracy beliefs, even though half of the news articles presented by the chatbot went against their personal perspective (especially in study 2 which included participants endorsing conspiracy beliefs in climate change specifically).

Findings in Study 1 indicated that individuals with higher conspiracy beliefs selected more mainstream news articles than alternative articles, which might suggest an effort to appear objective or well-informed in their news selection (Sutton & Douglas, 2020). However, findings from Study 2 demonstrated a small bias toward alternative news articles in both groups, which raises questions about whether the pattern observed in Study 1 reflects genuine information-seeking behaviour or context-dependent selection strategies. Future research should clarify whether self-presentation motives, epistemic curiosity, or mere exposure effects drive these observed differences.

While conspiracy believers expressed greater appreciation for the chatbot, they spent significantly less time reading three of the four mainstream news articles in Study 1. This pattern may reflect selective engagement rather than outright avoidance. According to motivated reasoning theory (Kunda, 1990), individuals tend to allocate cognitive effort selectively, engaging less deeply with information that contradicts their worldview while scrutinizing belief-consistent information more thoroughly. Similarly, reactance theory (Brehm, 1966, p. 135) suggests that exposure to counter-attitudinal information may trigger resistance responses, leading to more superficial processing.

However, an alternative interpretation is that individuals with lower conspiracy beliefs spent more time reading mainstream articles because they found them more relevant and engaging. In this case, reading time differences may not necessarily indicate avoidance but rather differential interest and attentional engagement. This explanation is consistent with research on confirmation bias (Ditto & Lopez, 1992), where individuals engage more deeply with attitude-consistent information. Future research should explore whether belief-driven differences in information processing extend beyond explicitly partisan content. Specifically, examining whether individuals engage similarly with neutral or mixed-perspective news sources would help disentangle motivated reasoning from general cognitive processing styles.

Moreover, participant ratings of the news chatbot on trust, attitude and intention to use the chatbot in the future indicated clear differences between the two groups with average scores of individuals with higher conspiracy beliefs ranging between 5.48 and 6.25 and average scores of individuals with lower conspiracy beliefs ranging between 4.05 and 5.19 on a 7-point scale. Different explanations may underly the evaluations of both groups. The favourable evaluations of the news chatbot by individuals with higher conspiratorial beliefs can be contextualized within their perception of mainstream media's climate change coverage. These individuals often feel that alternative or non-mainstream viewpoints on climate change are underrepresented in a media landscape that predominantly emphasizes the imminent dangers of climate change with absolute certainty (Painter et al., 2023). From their perspective, the framing and dissemination of climate change information in mainstream media may appear biased, potentially viewed as aimed at fostering public acceptance of stringent measures to address the issue (Woodworth, 2023). This can lead to the perception that mainstream media supports and highlights a particular agenda, in turn limiting exposure to other perspectives and facts that question the predominant narrative (Mullen & Klaehn, 2010). By categorizing alternative viewpoints as conspiracy theories, mainstream media messaging might discourage public consideration and discussion of differing opinions (Perini & Schie, 2024). Considering the perceived role of mainstream media, not just as an information provider but also as a potential influencer of public opinion, it is understandable that some individuals might value alternative news technologies that offer a wider range of perspectives, thereby addressing perceived gaps in mainstream media coverage (Brüggemann & Engesser, 2017; Mullen & Klaehn, 2010).

Interestingly, the group of participants with low scores in conspiracy belief was moderately positive in their evaluation of the balanced news chatbot with most participants scoring above the middle of the scales (4 - neither disagree nor agree) on trust, attitude and intention to use the chatbot, and a smaller set of participants scoring below (in particular in their intention to use the news chatbot; see Fig. 3c). This suggests that negative considerations about the balanced news chatbot as a daily news tool played a larger role in the evaluations of individuals with lower conspiracy beliefs than in those with higher conspiracy beliefs.

Comparable to what has been suggested for conspiracy theorists (e.g., Cinelli et al., 2021), individuals with a mainstream worldview may also engage in self-selected media bubbles (Heatherly et al., 2017; Weeks & Holbert, 2013), where they are surrounded by social networks (e.g., friends and family) and information sources that reinforce their existing beliefs and opinions (Brugnoli et al., 2019). One might reason that these individuals hold strong views about the antidemocratic dangers associated with conspiracy beliefs and tend to avoid engaging with

conspiratorial perspectives when consuming news. Moreover, those with a low conspiratorial ideation, i.e., individuals with lower conspiracy beliefs may activate psychological defense mechanisms (Hart, 2014) or may even experience psychological reactance when confronted with information that contradicts their worldview (Schwind et al., 2012). Consequently, a subset of individuals who do not subscribe to conspiracy beliefs may choose not to engage with a balanced news chatbot that also provides conspiratorial perspectives, thereby avoiding exposure to such information. Future research could further investigate these interpretations by exploring the reasons behind participants' evaluations of the balanced news chatbot and examining their emotional responses to receiving counter-attitudinal information.

4.3. Limitations and suggestions for future research

Although our research presents several strengths such as the robustness of the results in two consecutive studies, there are also limitations to our studies First, this research focused on comparing individuals at the higher and lower ends of the conspiracy belief continuum, excluding those with moderate conspiracy beliefs from the analyses. While our approach facilitates clear group comparisons, it also leads to a loss of variance and does not capture the full range of conspiracy beliefs. It should be noted though that the relationship between conspiracy belief groups (high vs. low) and participants' trust and intention to use the chatbot is maintained when individuals with moderate conspiracy beliefs are included in a regression analysis, at least for the second study[3] (see supplementary materials, Figures D1 and D2). Future studies could also adopt a continuous or multi-category approach to capture the spectrum of conspiracy beliefs, allowing for a more nuanced understanding of how trust and attitudes toward balanced news chatbots vary across different levels of conspiracy belief. Second, in the current research it remains unanswered if and how specific features of the chatbot contributed to its evaluations by the two different groups. Future studies could further specify the reasons that contributed to positive (and negative) user attitudes such as generally positive attitudes towards new technology versus towards the chatbot specifically, the presentation of diverse news headlines by the chatbot, or the possibility to choose what one wants to read. Third, both studies only involved a one-time interaction with the chatbot. It is possible that users' attitudes to the chatbot may change with repeated use. Moreover, we did not model the mediating effects of attitudes as no hypotheses were formulated regarding these effects. Future studies could investigate repeated use and mediating effects (e.g., perceived usefulness → attitude → intention) using a longitudinal study design. Fourth, our study is limited in drawing conclusions about the actual browsing behaviours of users. The internet is an extensive platform with many websites and products competing for user attention. Although we tried to mimic a real news chatbot by embedding it in an online survey, it remains to be seen whether participants will voluntarily interact with a chatbot when it is embedded on a news website or a social media app. Finally, while the chatbot in this study presented equal numbers of conspiratorial and non-conspiratorial news articles, users may appreciate some control over the mixture of news that is presented to them by news chatbots. Future studies may investigate the parameter settings or percentages of attitude congruent and incongruent news that news consumers are willing to accept when using news chatbots. This will be an important step to determine if balanced news chatbots or balanced news feeds can be effective tools in combatting echo chambers and polarisation in society.

[3] For the first study, we did not store the responses of the participants who scored moderately on the generic conspiracy beliefs scale. For study 2, the data for these participants were removed before the analyses were run.

5. Conclusion

The results of our studies encourage the use and further investigation of balanced news chatbots as an effective tool to reduce polarisation and conflict in our society. Our balanced news chatbot was evaluated favourably among individuals with lower as well as higher conspiracy beliefs, with high conspiracy believers showing a more positive attitude, greater perceived usefulness, higher trust, and greater intention to use a similar chatbot in the future. These findings suggest that balanced news chatbots could play an important role in counteracting conflict and distrust by presenting attitude-congruent as well as attitude-incongruent information to users. This could restore an open, inclusive, and respectful exchange of viewpoints in a joint ambition to create a better and more informed world.

CRediT authorship contribution statement

Shreya Dubey: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Paul E. Ketelaar:** Writing – review & editing, Writing – original draft, Supervision, Resources, Methodology, Investigation, Funding acquisition, Data curation, Conceptualization. **Tilman Dingler:** Writing – review & editing, Writing – original draft, Software, Resources, Formal analysis, Data curation, Conceptualization. **Hannah K. Peetz:** Writing – review & editing, Writing – original draft, Project administration, Investigation, Formal analysis, Data curation. **Hein T. van Schie:** Writing – review & editing, Writing – original draft, Supervision, Methodology, Funding acquisition, Data curation, Conceptualization.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2026.108920.

Data availability

Data will be made available on request.

References

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