Would I lie to you? How users evaluate faked online content depending on its publication type

Patrick Halbach
RWTH Aachen University
Aachen, Germany
halbach@comm.rwth-aachen.de

Laura Burbach
RWTH Aachen University
Aachen, Germany
burbach@comm.rwth-aachen.de

Johannes Nakayama
RWTH Aachen University
Aachen, Germany
nakayama@comm.rwth-aachen.de

Nils Plettenberg
RWTH Aachen University
Aachen, Germany
plettenberg@comm.rwth-aachen.de

Martina Ziefle
RWTH Aachen University
Aachen, Germany
ziefle@comm.rwth-aachen.de

André Calero Valdez
RWTH Aachen University
Aachen, Germany
calero-valdez@comm.rwth-aachen.de

Abstract—Since the unexpected outcome of the 2016 US elections and the Brexit referendum, the term fake news mutated to an almost daily mentioned topic in the media. Current research on this topic mostly deals with the effect of fake news on opinion formation, but rarely considers the publication type of the forged content. We investigate the differences in user assessment of faked content between an objectively written news article and an emotionally loaded conversation on a question and answer platform. Our results show, that news articles seem to be more credible and persuasive, but both faked publication types did not impel the users to change their opinion about an environmental topic.

Index Terms—Opinion formation, disinformation online, user study, personality traits,

I. INTRODUCTION

In the past years, the Internet increased the possibilities for different paths in opinion formation as it expanded the availability and variety of information. Simultaneously, this development facilitated the dissemination of news articles and personal opinions through social media platforms, thus giving the users the opportunity to also misuse their new opinion-sharing possibilities. One extensive discussed phenomenon is the advent of fake news, which means spreading disinformation disguised as news articles [1]. Reasons to consciously share such misleading information are wide-ranging from simple financial through to political motives [2]. At the latest, since the unexpected outcomes of the US elections, this phenomenon gained high popularity also in mass media and the general public [3] and recent research extensively dealt with the effect of disinformation on the opinion formation of Internet users, but rarely considered the type of the forged content so far.

In our study, we focused on different content types of disinformation and raised the hypothesis, that the application area of disinformation plays a role for its effectiveness. We therefore compared two types of faked content:

1) A scientific news article
2) A conversation on a question and answer platform

Recent studies focus mainly on faked news articles and social media platforms such as Facebook [4] or Twitter or also on faked product reviews [5], but we think that almost every online platform with user interaction and user generated content is vulnerable to faked content and that the effect on the users can differ regarding to the purpose of the platform. Because of past research outcomes we assumed, that content which addresses the opinion and emotions of a reader more directly could gain more persuasiveness than a news article [2] and therefore we chose a conversation of a question and answer website for comparing their effectiveness.

As the topic for our investigation we chose environmental pollution through disposable cups, because environmental topics as for example also climate change show high sensitivity for misleading information and are currently very present in the media [6].

Our contribution is a user study with 104 participants that measured the effect of presentation type on various outcome measures and included personality traits as co-variates.

II. RELATED WORK

A. Fake News, Misinformation and Disinformation

One of the core problems, when dealing with online content that contains false information, is to determine what exactly the content relates to. The term "fake news" is often used, still however no consistent definition exists and its recent use as an insult towards traditional media outlets by politicians has tainted the originally intended meaning of the term.

Originally, the term was used to signify content on the Internet that came in the shape of news content, yet contained false information [7]. The term quickly became popular during the Trump elections and the Brexit movement, as both sides of the argument claimed the other side was basing its opinion on "fake news". Typically, fakes news must be discerned from accidental false news by respectable news outlets. Sometimes,

journalists, under the pressure to deliver sell-able content on daily basis, fall for false facts and report on them without additional fact checking. The intent behind such articles is not malicious. This is not considered "fake news". This is simply bad journalism. Furthermore, satire, false claims by individuals, conspiracy theories, memes, etc. are not considered fake news.

Overall, more relevant terms are misinformation and disinformation. Not overloaded with ambiguity, the former relates to false information (on the Internet) with no ill intent. Sometimes, information can be wrong, but not purposefully crafted to sway the public opinion. The latter relates to false information that was crafted with the intent to manipulate opinions. Fake news in this sense, would be a phenomenon— or a type of publication—of disinformation. However, disinformation may come in other forms as well. For example, faked quotes of people from the public sphere, that were intentionally generated to harm those people or to manipulate public opinion, are also considered disinformation. In social media, faked quotes are particularly hard to eradicate.

The credibility of the classical media has suffered with the rise of digital news media [8] and suffered in general [9]. User generated content on the other has high levels of credibility [10] given that the reader perceived the author of the content to be socially similar to themselves. Social similarity detected through similar language use and shared societal visions play a larger role for trusting someone in regard to knowledge transfer than more visible criteria, such as level of education, job position, etc. [11].

Examining factors that influence the trust in scientific claims in social media, Verma et al. [12] found out that the sheer existence of numbers in article increase the reader's trust in an article, as well as the existence of hyperlinks. Hyperlinks to scientific papers, mainstream media, or hidden URLs have an higher influence on trust than links to fake news sites or posts missing a hyperlink.

B. Ignorance of environmental issues, climate change

The previous reflections on the credibility of factual and un-factual information in social media and digital news rise the question what the consequences of such seemingly irrational behaviors might be. One topic where peoples' believes strongly diverge from their actions is climate change and environmental pollution. A large proportion does accept that man-made climate change exists [13], however, those who do not, are even harder to convince otherwise. Skeptics of climate change asymmetrically update their believes about climate change. Evidence that speaks against man-made climate change is readily accepted, while evidence for climate change is highly distrusted [14].

Even when people do believe that climate change is real, many fail to take action. As the individual impact on climate change is rather minimal, people perceive their own influence to be negligible [15]. Everyone waits until everybody else starts doing something about climate change. In a media setting, where fake news about climate change are spread in socially similar groups on social media, climate change deniers find ample "evidence" for their theories in filter bubbles [16].

Additionally, people might readily accept evidence that clears their conscience, when it fits into their behavioral patterns—even if the evidence is weak. The aim here is to reduce cognitive dissonance [17]. Smokers, e.g., will readily accept evidence that shows that smoking is not unhealthy. The motivation stems from integrating contradictory thoughts. 1) smoking is unhealthy, 2) I am a smoker, 3) I would like to be healthy. Since 2 and 3 are hard to change, cognitive dissonance theory yields, that people readily reconsider the first assumption to remove the dissonance that the simultaneous believe in all three statements would cause.

C. The influence of personality traits

In recent research, the influence of the user's personality traits on their beliefs in different argument types has rarely been examined so far.

Fraj and Martinez [18] conducted a survey with 573 participants which indicated that consumers with higher levels of extraversion, agreeableness and conscientiousness tend to buy more eco-sensitive products.

Lukin et al. [19] investigated the effect of personality traits on the persuasiveness of different argument types. People that are agreeable and open to new experiences are more likely to be persuaded when the argument takes an emotional stance than when it takes a rational stance.

Further, research regarding the influence of personality traits on the responsiveness to stimuli by images showed that high level of neuroticism enhanced the effect [20]. However, this was the case for female body dissatisfaction and so far it has not been examined whether this effect can also be observed in other fields like environmental pollution.

Summarizing, we see that the antecedents of persuasion in online news exchange have not sufficiently been studied, as different models predict differing outcomes. In order to improve understanding of the effect of personality traits on online persuasion, we conduct a user study in the context of climate change. Besides measuring personality traits we look at different argument types or publication types.

III. METHOD

A. Online questionnaire

We performed an online questionnaire which investigated several demographical factors such as gender, age and education and examined the Big Five personality traits extraversion, conscientiousness, neuroticism, openness and agreeableness. For determining the personality traits, the BFI-K short scale was used as it provides an economical and reliable replacement for the original 44-items Big Five question set and reduces complexity and duration for answering notably [21].

The second part of the questionnaire dealt with the use and consequences of disposable cups. Introducing, the participants were asked how regularly they buy a hot drink on the go. Afterwards, a scenario put them in a position to be on the move around the city willing to buy a hot drink in a bakery.

Fig. 1. The research design of our study

It was then questioned, whether they would bring their own cup or they would use a disposable cup to do so.

Following, the role of environmental awareness was assessed by asking for a guilty conscience when using disposable cups and evaluating the attitude towards one-way cups compared with own cups brought along.

Depending on whether the participants were willing to waive disposable cups or not, they had the possibility to choose between several reasons for or against their sacrifice.

In order to create a higher awareness for the potential environmental pollution through disposable cups and to give a certain cue for supporting the use of reusable cups a picture of a polluted area was shown (see Figure 2) and it was asked how regularly such states are perceived in the city. Three further questions related to the picture covered the consternation, if such states are rated as polluting and if they are a motivation for choosing multi-use cups over disposable cups.

After this, we used a between-subject design to confront the participants either with a faked news article or a falsified conversation of a question and answer platform. Both contained reasons for preferring disposable cups over bringing an own cup for reuse and thereby contradicted the previously presented cue in terms of the outcomes of disposable cups use.

The participants were queried for the informativeness, relevance, trustworthiness, preciseness, persuasiveness, and interestingness of the content that was presented to them. They were also asked, if they would approve the brought forward arguments and if they would now feel better with using single cups. Furthermore, they were questioned about their will to

Fig. 2. The negative cue

change their behavior for cups use on the basis of the content and if they looked up further information about the topic during and after the survey. In the end, we asked the users about the frequency and purpose of their internet and social media use.

B. Statistical analysis

The obtained data was analyzed afterwards using IBM SPSS Statistics v24. The primary goal was to investigate the differences in the perception of the falsified content types. Differences of the between-group design therefore were tested using T-tests for independent samples. Furthermore, the role of the Big Five personality traits was inspected by calculating Pearson's correlation coefficients.

We used for all statistical examinations a level of significance at $\alpha = .05$.

IV. RESULTS

This section deals with the results of our study and describes at first the characteristics of our sample to gain a better understanding for the outcomes. Later on, the underlying differences in decision making and trust in the examined content types are looked at.

A. Sample description

Our sample comprised 104 participants of whom 56% were women and 44% were men. The mean age was 28.1 years (SD=9.79) and over 55% of the sample named a bachelor's degree or higher as level of education. The Big Five personality traits were measured through the BFI-K short scale which reduces the time exposure while preserving the original psychometric parameters [21]. The factors extraversion, conscientiousness and openness values were located below the scale mean, whereas neuroticism and tolerance were most apart from it (see Table I).

97% of the sample classified themselves as daily Internet users from which the majority stated that they would use the

Big Five Factor	Mean	Standard Deviation	Reliability
Extraversion	2.95	0.65	$\alpha = .85$
Conscientiousness	3.04	2.39	$\alpha = .70$
Neuroticism	2.39	0.68	$\alpha = .83$
Openness	3.10	0.48	$\alpha = .59$
Tolerance	2.50	0.52	$\alpha = .56$

Internet even on an hourly schedule. The significant correlation between the age of the participants and their frequency of Internet use shows, that older participants spent less time on using the web then their younger counterparts did ($r(104) = -0.45$; $p < .01$).

We also questioned the purpose of the Internet use with concrete examples. Regarding the standard errors of the mean values, the use intentions social communication, information search, research, and entertainment were the most chosen reasons by the participants with a minimum of 83% of the sample. Online shopping was less important but still a relevant factor for three-quarters of the participants while streaming was the least named purpose (see Figure 3).
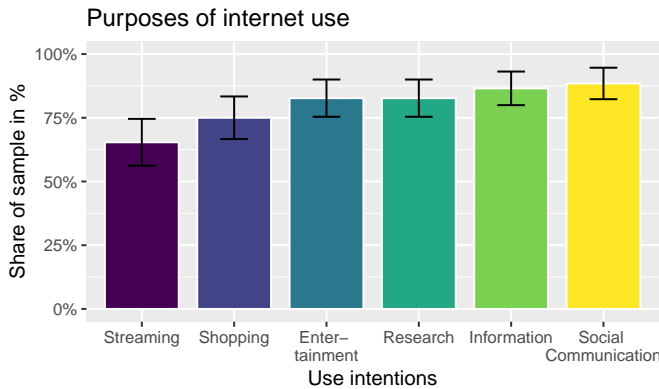

Fig. 3. Purposes for the use of Internet. Error bars denote a 95% confidence interval.

B. Attitudes towards disposable cups

Concerning the disposable cups use, 92% of the participants preferred using them over bringing an own cup with respect to the introduced scenario. The disposable cups were valued as more practical ($t(103) = 5.57$, $p < .01$) and cheaper ($t(103) = 2.36$, $p < .05$), but also more polluting ($t(103) = 14.68$, $p < .01$) and less stylish ($t(103) = -8.72$, $p < .01$) than an own cup (see Figure 4).

Nevertheless, a majority of 73% of the sample stated that they would be willing to avoid using disposable cups permanently. Depending on their willingness, they were asked for the reasons of their decision afterwards. Those who supported the avoidance named especially environmental reasons for their
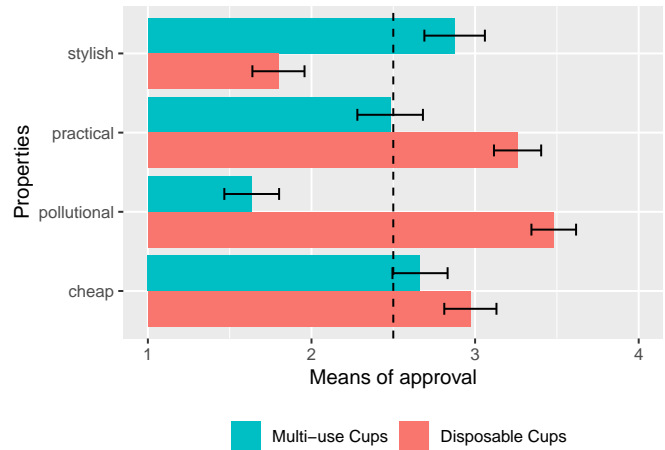

Fig. 4. Evaluation of the different cups type with regard to specific properties. Error bars denote a 95% confidence interval.

sacrifice (see Figure 5). Also the ease of use and the comparable costs of multi-use cups were acceptable motivations for a change. Social influence through trendsetters or friends by contrast were less influential for their decision.
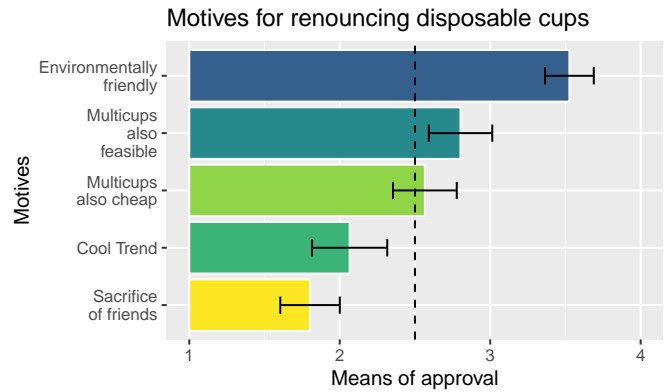

Fig. 5. Motives for renouncing disposable cups. Error bars denote a 95% confidence interval.

The opponents of renouncing disposable cups (27% of the sample) justified their choice above all with the inconveniences which are experienced through bringing an own cup. The appearance as a current trend and the higher costs of using own cups were rather unimportant for their rationale. The opponents also showed the tendency to exclude social reasons as they disagreed to follow the behavior of their friends in not renouncing disposable cups. Also the higher environmental soundness of disposable cups compared to multi-use cups was not accepted as a reason for deciding against renunciation.

C. The role of personality traits for environmental awareness and sense of guilt

We examined the relationship between the collected Big Five personality traits and the consternation of environmental
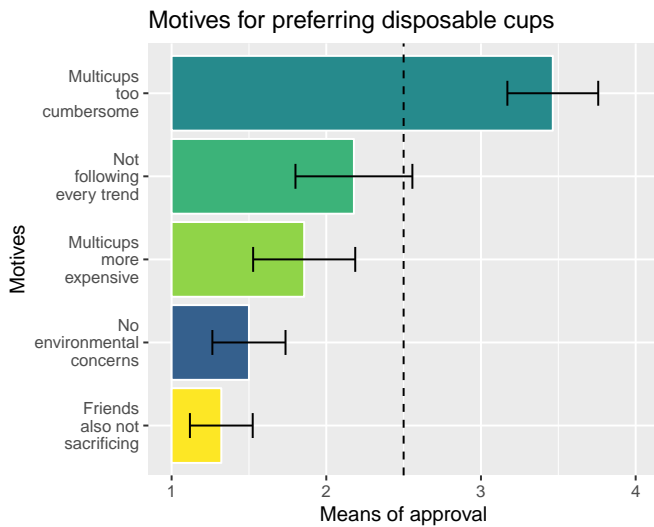
Fig. 6. Motives for renouncing multi-use cups. Error bars denote a 95% confidence interval.

pollution through disposable cups. Therewith we also wanted to measure the effect of the negative cue on the guilty conscience of the participants. Beforehand, we asked the users about experiencing a guilty conscience through disposable cups use and found, that those participants with higher values of conscientiousness, openness and tolerance felt worse about their behavior (see Table II).

Overall, only 9% of the participants stated that the sight didn't shock them at all. 85% of them saw polluted states like the one presented in the cue at least occasionally. Nearly all participants (93%) estimated such states as burden for the environment and the majority of them was motivated through this view to use reusable cups more frequently in the future ($M = 1.62$; $SD = 0,49$).

As could be expected, especially the personality trait conscientiousness showed numerous relationships with the related questions on perception and feeling about the presented state. People with higher conscientiousness also showed a higher environmental awareness, were more shocked because of the pollution and had a higher motivation to take act against pollution through disposable cups (see Table II).

The extraversion and openness of an individual were also positively related to the motivation for using less disposable cups, but showed no significant correlations with the factors of environmental awareness. On the contrary, the tolerance was not significantly correlated with the examined factors at all (see Table II).

Further it could be shown, that the willingness to renounce the use of disposable cups influences the concern with the presented state. Participants with no intention to reduce their use of one-way cups were also less shocked by the sight of the polluted public area ($M = 2.14$, $SD = 0.71$) than those who stated the will to forgo ($M = 2.51$, $SD = 0.60$, $t(102) = -2.66$, $p < .01$). With regard to the sample size and the unequal group sizes this difference still shows a considerable effect ($d_{Cohen} = 0.59$).

D. The influence of content type on credibility

The between-groups comparison with the variation of the content type revealed several differences in the assessment of credibility due to source of the information.

A similarity of both content types shows in their capability of giving food for thought for the majority of participants in both sub-samples (Survey item: Did the content make you thoughtful?). Conversely, multiple of the content properties which were referring to the particular content type varied significantly between the news article and the conversation. The subgroup which was confronted with the news article, rated the content as more informative ($t(76.4) = 4.23$, $p < .01$), trustworthy ($t(77.6) = 2.91$, $p < .01$) and persuasive ($t(102) = 2.54$, $p < .05$) than the subgroup who saw the conversation (see Figure 7). The conversation then again was valued as more irrelevant ($t(102) = -2.35$, $p < .05$), less precise ($t(102) = -2.08$, $p < .05$) and rather uninteresting ($t(102) = 3.46$, $p < .01$) in comparison to the news article. The remaining content properties showed no significant group differences ($p > .20$). The participants weighted the importance a little over the scale mean ($M_{all} = 2.79$, $SD_{all} = 0.75$). The tellingness of the content ($M_{all} = 2.53$, $SD_{all} = 0.68$) and the shockingness ($M_{all} = 2.64$, $SD_{all} = 0.87$) obtained mediocre agreements of the participants.

Also in terms of argument strength the news article obtained higher approval in the brought up arguments from its readers ($M_{all} = 2.67$, $SD_{all} = 0.60$, $t(102) = 0.96$, $p = .34$).

E. Opinion change through misinformation

Subsequently to the evaluation of credibility, the participants were asked how their viewpoint of the introduced topic was changed through the presented content. Therefore we asked if the content triggered a more positive feeling for using disposable cups. While for the overall sample the majority (72%) felt no improvement of their guilty conscience, the evaluation of this question differed regarding content type significantly. Readers of the news article stated a higher relief of conscience ($M = 1.37$, $SD = 0.49$) than the readers of the conversation ($M = 1.16$, $SD = 0.37$, $t(101.8) = 2.47$, $p < .05$). This difference shows a moderately strong effect regarding Cohen's d ($d_{Cohen} = 0.47$).

Both groups of content readers were in sum rather undecided if they would change their attitude and usage habits of disposable cups. Also in researching additional information while reading the content and the motivation for further examination of the topic the groups showed no significant differences (see Table III). Summarizing, just 7% of the participants looked up further information during the questionnaire and the motivation for dealing further with this topic was mediocre at a scale from 1 = not motivated at all to 4 = very motivated ($M = 2.46$, $SD = 0.82$).

Big Five Factor / Environmental Attitudes	Guilty conscience	Ready for Sacrifice	Pollution perceived	Pollution shocking	Pollution harmful	Pollution motivational
Extraversion	.189	.079	.073	.085	.024	.201*
Conscientiousness	.279**	.170	.099	.240*	.264**	.327**
Neuroticism	-.159	.025	.081	.144	.029	-.004
Openness	.211*	-.045	.030	.126	.035	.286**
Tolerance	.206*	.026	-.136	.188	-.003	.167

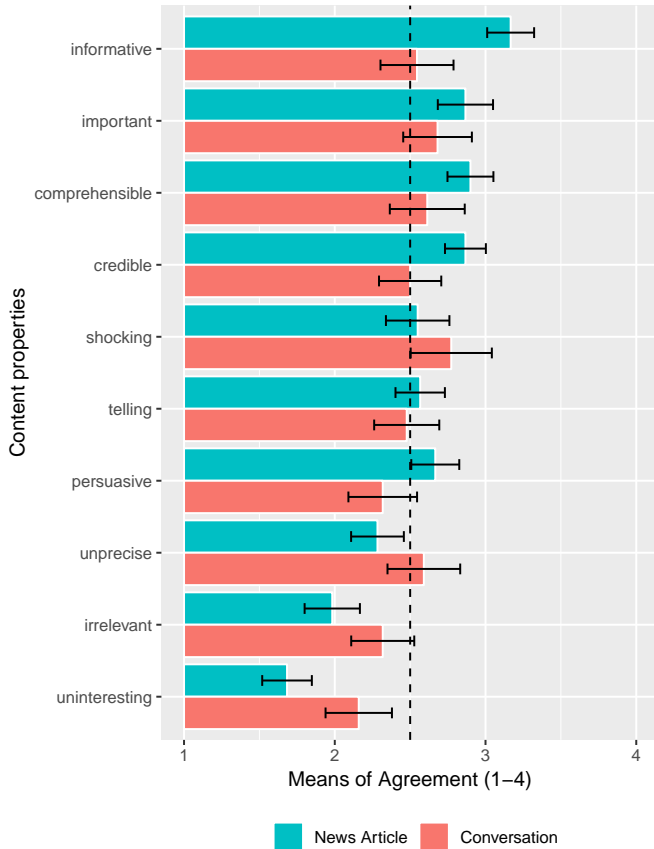|	Scale	News Article (N=60)		Conversation (N=44)		T-Test	
		M	SD	M	SD	t-Value	Sig.
Opinion Change	1-4	2.35	0.63	2.50	0.82	$t(77.87) = -1.01$	$p = .31$
Lookup of further info	1-2	1.10	0.30	1.02	0.15	$t(91.35) = 1.71$	$p = .09$
Motivation for further examination	1-2	2.57	0.83	2.32	0.80	$t(102) = 1.53$	$p < .13$

Fig. 7. Comparison of the news article and the conversation regarding the questioned content properties. Error bars denote a 95% confidence interval.

V. DISCUSSION

Our results deliver new insights into the effect of personality traits on the awareness of cognitive dissonances and the influence of content type on the evaluation of misinformation. On the one hand, we could show that personality traits influence the way how environmental pollution is perceived and assessed. On the other hand, clear differences in terms of evaluation between the presented news article and the online conversation could be established. While both content types did not motivate the participants to change their opinion regarding the use of disposable cups, the higher perceived credibility of the news article seemed to give them a higher relief of guilty conscience in terms of environmental pollution than the conversation did.

Concerning the reasons for or against the sacrifice of disposable cups our results show, that rational reasons such as the cost and feasibility of the cups seem to outrun reasons resting on social norms and pressure like the behavior of friends or the community in general.

Regarding the effect of cognitive dissonance, our study extends the findings of prior research. While the perception of environment-pollutional states showed no significant relationship to the obtained personality traits, the experience of a guilty conscience because of using disposable cups increased with a higher conscience, openness and tolerance. The same personality traits lead also to a higher motivation for taking action against the pollution through switching to multi-use cups. Additionally, a higher conscience also increased the shock because of the pollution and the awareness of its harmfulness. Those relations also occur in other research, as for example concerning binge flying behavior which was examined by Cohen et al. and the perception of its climatological consequences. They found, that extensive flying is more

and more detected as environmentally harmful and therewith connected to a higher sense of guilt and spanning a cognitive dissonance between behavior and conscience [22].

The lower credibility of the conversation compared to the news article may be a consequence of the general skepticism towards user generated content on internet platforms which was revealed in other research [23]. Its credibility is improvable through multiple approaches. One of them is to introduce new source cues like the online service Klout.com does with its single indicator for the influence a certain social media user holds in its network. The simple existence of such a cue shows a significant positive effect on source credibility: The content from users who are rated with a higher Klout.com score obtain also a higher trustworthiness compared to users with lower score [24]. Such scores are also comparable to the experience of forum users which is often stated within their posts through the count of posted items. Those types of ratings work even better, if an individual can identify with the group in the particular online environment. Relating to the example of an online forum this means that a user who feels more part of the group will also value the information which is contributed from other users of the same group as more credible than content from others [25].

Further it can be argued, that there are more factors besides trustworthiness which have an influence on the intention to use UGC for certain purposes as Ayeh et al. found out for user ratings of hotels. They developed an acceptance model for the application of user generated content to plan a journey and found that the attitude of an individual occupies a central role for behavioral intention. Their modelling of source credibility integrates trustworthiness and expertise for describing its connection to the acceptance of user generated hotel ratings [23]. Such an approach could also be reasonable for misinformation at question and answer platforms, as some of those sites also provide information about the expertise of its members through presenting their total number of given answers. For proving the transferability of the proposed acceptance network of Ayeh et al. it is necessary to evaluate the impact of such source cues at the rating of credibility on question and answer platforms in future research.

Although the news article gained higher ratings in informativeness and credibility by its readers than the conversation, the readers were still not convinced to change their attitude using disposable cups and therewith reducing environmental pollution. Overall, our expectations regarding the role of identification with the shared opinions were contradicted. We expected, that the more emotionally charged conversation at the question and answer platform would contribute to an opinion change through higher identification of the participants. It is conceivable, that the diversity of opinions was low after showing the scenario with environmental pollution, because the connotation of the scenario could have been too negative and unilateral. Other researchers value a high diversity of opinions as particularly important for the effectiveness of fake news [2].

Besides the beforehand reported findings it is also important to consider some limitations regarding the chosen research approach to weight the validity and transferability of our results. Since investigating the effect of misinformation in online contexts is a relatively new research area with rare role models, we decided to choose a between-groups design. The obtained sample was rather small for meeting sound group comparisons, but it can help with giving a first direction for assessing the differences between the two investigated content types. Furthermore, the sample was above average educated and younger than the average population.

Future research should shed a light on topics with more opinion diversity and relevance for the users and should collect larger samples for more significant group comparisons.

VI. Conclusion

It could be shown, that the environmental behavior of an individual depends on its personality traits, especially in terms of guilty conscience. On the other side, the higher trusted news article did relieve this guilty conscience and therewith shows a considerable effect of misinformation in online environments. Nevertheless, the misinformation was not able to induce a measurable opinion change. Further research is required to completely reveal the interdependencies between personality traits, cognitive dissonance and the content type of misinformation. As a practical implication for communication professionals it can be seen, that the kind of representation of online information can influence its effectiveness and trustfulness.

References

[1] Victoria L Rubin, Yimin Chen, and Niall J Conroy. Deception Detection for News: Three Types of Fakes. In *Proceedings of the 78th ASIS&T Annual Meeting: Information Science with Impact: Research in and for the Community*, ASIST '15, pages 83:1–83:4, Silver Springs, MD, USA, 2015. American Society for Information Science.

[2] Edson C. Tandoc, Zheng Wei Lim, and Richard Ling. Defining "Fake News". *Digital Journalism*, 6(2):137–153, 2 2018.

[3] Hunt Allcott and Matthew Gentzkow. Social Media and Fake News in the 2016 Election. *Journal of Economic Perspectives*, 31(2):211–236, 5 2017.

[4] Eugenio Tacchini, Gabriele Ballarin, Marco L. Della Vedova, Stefano Moret, and Luca de Alfaro. Some Like it Hoax: Automated Fake News Detection in Social Networks. *Journal of Economic Perspectives*, 31(2):211–236, 5 2017.

[5] Nitin Jindal and Bing Liu. Opinion spam and analysis. In *Proceedings of the international conference on Web*

search and web data mining - WSDM '08, page 219, New York, New York, USA, 2008. ACM Press.

[6] Sander van der Linden, Anthony Leiserowitz, Seth Rosenthal, and Edward Maibach. Inoculating the Public against Misinformation about Climate Change. *Global Challenges*, 1(2):1600008, 2 2017.

[7] Hunt Allcott and Matthew Gentzkow. Social media and fake news in the 2016 election. *Journal of economic perspectives*, 31(2):211–36, 2017.

[8] Thomas J Johnson and Barbara K Kaye. Cruising is believing?: Comparing internet and traditional sources on media credibility measures. *Journalism & Mass Communication Quarterly*, 75(2):325–340, 1998.

[9] Spiro Kiousis. Public trust or mistrust? perceptions of media credibility in the information age. *Mass Communication & Society*, 4(4):381–403, 2001.

[10] Julian K Ayeh, Norman Au, and Rob Law. "do we believe in tripadvisor?" examining credibility perceptions and online travelers' attitude toward using user-generated content. *Journal of Travel Research*, 52(4):437–452, 2013.

[11] Daniel Z Levin, Rob Cross, and Lisa C Abrams. Why should i trust you? predictors of interpersonal trust in a knowledge transfer context. In *Academy of Management Meeting, Denver, CO*, 2002.

[12] Nitin Verma, Kenneth R. Fleischmann, and Kolina S. Koltai. Human values and trust in scientific journals, the mainstream media and fake news. *Proceedings of the Association for Information Science and Technology*, 54(1):426–435, 1 2017.

[13] Wouter Poortinga, Alexa Spence, Lorraine Whitmarsh, Stuart Capstick, and Nick F Pidgeon. Uncertain climate: An investigation into public scepticism about anthropogenic climate change. *Global environmental change*, 21(3):1015–1024, 2011.

[14] Cass R Sunstein, Sebastian Bobadilla-Suarez, Stephanie C Lazzaro, and Tali Sharot. How people update beliefs about climate change: Good news and bad news. *Cornell L. Rev.*, 102:1431, 2016.

[15] Cynthia M Frantz and F Stephan Mayer. The emergency of climate change: Why are we failing to take action? *Analyses of social issues and public policy*, 9(1):205–222, 2009.

[16] H.T.P. Williams, J.R. McMurray, T. Kurz, and F. Hugo Lambert. Network analysis reveals open forums and echo chambers in social media discussions of climate change. *Global Environmental Change*, 32:126–138, 2015.

[17] Leon Festinger. *A theory of cognitive dissonance*, volume 2. Stanford university press, 1957.

[18] Elena Fraj and Eva Martinez. Influence of personality on ecological consumer behaviour. *Journal of Consumer Behaviour*, 5(3):167–181, 5 2006.

[19] Stephanie M Lukin, Pranav Anand, Marilyn Walker, and Steve Whittaker. Argument strength is in the eye of the beholder: Audience effects in persuasion. *arXiv preprint arXiv:1708.09085*, 2017.

[20] Alan Roberts and Emily Good. Media images and female body dissatisfaction: The moderating effects of the Five-Factor traits. *Eating Behaviors*, 11(4):211–216, 12 2010.

[21] Beatrice Rammstedt and Oliver P John. Kurzversion des Big Five Inventory (BFI-K): Entwicklung und Validierung eines ökonomischen Inventars zur Erfassung der fünf Faktoren der Persönlichkeit. 4:195–206.

[22] Scott A. Cohen, James E.S. Higham, and Christina T. Cavaliere. Binge flying: Behavioural addiction and climate change. *Annals of Tourism Research*, 38(3):1070–1089, 7 2011.

[23] Julian K. Ayeh, Norman Au, and Rob Law. "Do We Believe in TripAdvisor?" Examining Credibility Perceptions and Online Travelers' Attitude toward Using User-Generated Content. *Journal of Travel Research*, 52(4):437–452, 7 2013.

[24] Chad Edwards, Patric R. Spence, Christina J. Gentile, America Edwards, and Autumn Edwards. How much Klout do you have...A test of system generated cues on source credibility. *Computers in Human Behavior*, 29(5):A12–A16, 9 2013.

[25] Andrew J. Flanagin, Kristin Page Hocevar, and Siriphan Nancy Samahito. Connecting with the user-generated Web: how group identification impacts online information sharing and evaluation. *Information, Communication & Society*, 17(6):683–694, 7 2014.

ABOUT THE AUTHORS

Patrick Halbach (M. Sc.) works as research assistant at the chair of Communication Science at RWTH Aachen University, Germany and is part of the junior research group 'Digitale Mündigkeit'. In his research, he currently deals with opinion formation in online contexts, especially focusing on the impact of social media and the spread of misinformation on such platforms.

Laura Burbach (M.A.) is research assistant at the Human-Computer Interaction Center. Since 2018 she is part of the junior research group 'Digitale Mündigkeit'. She is currently investigating whether and to what extent different recommendation systems, voice assistants and individuals are accepted by users of social media. Besides her research focuses on target groups of Life-Logging.

Johannes Nakayama (B. Sc.) is a student assistant at the chair for cimmunication science at RWTH Aachen University and a part of the junior research group "Digitale Mündigkeit". He is a Master's student majoring in technical communication (communication science and computer science) and he specializes in recommender systems research.

Nils Plettenberg (B. Sc.) works as student assistant at the chair for communication science at the RWTH Aachen University, Germany where he is part of the junior research group 'Digitale Mündigkeit'. He is studying the master's program

electrical engineering with a major in computer engineering. His research focuses on the spread of news in social media.

Martina Ziefle is Professor of Communication Science and head of the Human Computer Interaction Center of RWTH Aachen University. Her research focuses on the interface between humans and technology, taking into account different usage contexts and user requirements. She focuses in particular on the sensitive area of eHealth technologies, in which user diversity and technology acceptance play a decisive role.

André Calero Valdez (PhD) is junior research group leader at the RWTH Aachen University, Germany. His research focuses the interaction of humans and algorithms such as recommender systems, information visualization, and machine learning in a wide variety of applications. The fields of application range from social media over health informatics to industry 4.0.