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Misinformation on social media: Individual reception and the importance of self-directed internet search for rebuttal

Fehlinformationen in sozialen Medien: Individuelle Rezeption und die Bedeutung eigenständiger Internetsuche zur Widerlegung

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Abstract: In the era of COVID-19 and the Ukraine war, the proliferation of misinformation on social media raises concerns for both individuals and society. This study delves into its reception and effects on attitudes, with a focus on individual verification processes through independent online information search. Drawing on a multimethod laboratory experiment involving 86 participants, the study addresses two key questions. First, it examines differences in the reception process between accurate and misleading social media posts and how it can influence the impact of misinformation. Second, it scrutinizes individual information search and selection processes, assessing their impact on recipient attitudes. The eye-tracking data reveal similar reception engagement with accurate and misleading posts. An effect was observed only with the accurate posts, independent of reception processes. Screen-recorded online search processes enhance the assessment of (mis)information correctness, albeit with topic-specific variations. Implications for countering misinformation and enhancing digital literacy are discussed.

Keywords: Misinformation, Rebuttal, Debunking, Online Information Search, Social Media, Eye Tracking, Screen Recording, COVID-19, Ukraine War

Zusammenfassung: Im Zeitalter von COVID-19 und dem Ukraine-Krieg wirft die Verbreitung von Fehlinformationen in sozialen Medien sowohl für Einzelpersonen als auch für die Gesellschaft Bedenken auf. Diese Studie untersucht deren Rezeption und Auswirkungen auf Einstellungen, mit einem Fokus auf individuellen Verifizierungsprozessen durch eigenständige Online-Informationssuche. Basierend auf einem multimethodischen Laborexperiment mit 86 Teilnehmenden werden zwei zentrale Forschungsfragen behandelt. Erstens wird untersucht, inwieweit sich der Rezeptionsprozess zwischen korrekten und fehlinformierenden Social-Media-Posts unterscheidet und wie dies die Wirkung von Fehlinformationen beeinflussen kann. Zweitens werden die individuellen Informationssuch- und Auswahlprozesse analysiert und deren Einfluss auf die Einstellungen der Rezipierenden evaluiert. Die Eye-Tracking-Daten zeigen ein ähnliches Rezeptionsengagement bei korrekten und fehlinformierenden Posts. Ein Effekt wurde jedoch nur bei den korrekten Posts festgestellt, unabhängig von den Rezeptionsprozessen. Die aufgezeichneten Online-Rechercheprozesse verbesserten die Bewertung der Korrektheit von (Fehl-)Informationen, wenn auch mit themenspezifischen Variationen. Die Implikationen für den Umgang mit Fehlinformationen und die Förderung digitaler Kompetenz werden diskutiert.

Schlagwörter: Fehlinformationen, Widerlegung, Entlarvung, Online-Informationssuche, Soziale Medien, Eye Tracking, Bildschirmaufzeichnung, COVID-19, Ukraine-Krieg

1. Introduction

Especially during a crisis, misinformation flourishes on social media, which can have negative repercussions for individuals and society as a whole (Lazer et al., 2018; Tucker et al., 2018). This was evident with political issues, such as in the last U.S. presidential election (Bovet & Makse, 2019) or the Ukraine war (OECD, 2022; Pierri et al., 2023) and health-related issues, such as in the COVID-19 pandemic, where a large amount of (false) information was and is disseminated worldwide (Zeng & Chan, 2021), leading the WHO to use the label "infodemic" (WHO, 2020).

Misinformation refers to information that is not correct (Möller et al., 2020). Politically motivated misinformation can pose a serious threat to democracy. In a democratic society, every citizen has the right to shape the outcome of elections and thus their country's political and social reality through their vote. A prerequisite for this is that information is freely accessible and factually accurate. (Social) Media plays a significant role as it facilitates public discourse and is supposed to reflect the diverse opinions and sentiments within the population. However, the deliberate spread of misinformation, especially on social media, systematically undermines this essential element of a functioning democracy (e.g., Avaaz, 2020; Bradshaw & Howard, 2018; Echtermann, 2020; Knuutila et al., 2020; Tandoc et al., 2020). Free formation and expression of opinions through the media should be accessible to all, but misinformation can distort public discourse.

When users encounter online misinformation, one way to address it is with an information search to verify its correctness before believing it (Kessler & Humprecht, 2023). This verification aims to form a personal opinion about evidence and accuracy based on additional reliable information (Sun, 2022). Unfortunately, only a few individuals actively check the (false) information they encounter online (Kessler et al., 2022). Moreover, people vary in their success in searching for, finding, evaluating, and applying evidence-based information online (De Gani et al., 2021). A demand was made for more (critical) digital information literacy (Brisola & Doyle, 2019; Brørs et al., 2020), but the fear became prominent that people will consciously or unconsciously select media offerings and content in online searches that correspond to their own attitudes (selective exposure; Zillich & Kessler, 2019).

My aim was to investigate the reception of misinformation on social media on attitudes, with a particular focus on individual verification processes through independent online information search.

2. Misinformation: Definition, dissemination, reception, and impact

The definition of misinformation and disinformation has sparked a broad scientific discussion (Möller et al., 2020). The most widely accepted consensus is that disinformation must encompass two elements: 1) it involves information that is not correct; 2) it has been intentionally disseminated (Möller et al., 2020; Tandoc

et al., 2018; Wardle, 2018). Regarding the testing of correctness, specifically in the field of health, misinformation can be defined as "any health-related claim of fact that is false based on current scientific consensus" (Chou et al., 2020, p. 5273). In many studies, misinformation is referred to in general, with disinformation considered a subset of misinformation; this approach is also taken in the present study. The intentions behind spreading misinformation are hard to measure and can vary, including purely political, economic, religious, or social motives (Bennett & Livingston, 2018). The purpose behind politically motivated misinformation in Western countries is often to unsettle free and democratic society through targeted misinformation, inhibiting people from making informed decisions in their political or daily actions. Politically motivated misinformation primarily seeks to influence public opinion through false narratives, generate uncertainty and mistrust among the population, disrupt democratic processes, and foster societal polarization (Bennett & Livingston, 2018; Marwick & Lewis, 2017), such as in Russian misinformation campaigns in 2007 in Estonia, 2014 Ukraine crisis, 2016 Brexit referendum, recent U.S. presidential elections, and the Ukraine war (Bovet & Makse, 2019; OECD, 2022; Pierri et al., 2023). Regarding the Ukraine war, misinformation is deliberately disseminated, for instance, to diminish support from citizens and governments of other countries for the Ukrainian population (Correctiv, 2022). Politically motivated misinformation in the field of health topics has notably manifested online to a significant extent about the COVID-19 pandemic (Zeng & Chan, 2021).

Social media platforms and messaging services, in particular, facilitate the rapid and widespread dissemination of misinformation (e.g., Avaaz, 2020; Bradshaw & Howard, 2018; Echtermann, 2020; Knuutila et al., 2020; Tandoc et al., 2020). It is sometimes spread faster and further on the internet and social media than correct information. A study uncovered that false social media posts had a higher likelihood of being retweeted compared to accurate posts (Vosoughi et al., 2018), and another revealed that false information on Facebook garners six times more user engagement than factual posts (Edelson et al., 2021). On social media, any individual can post and share unverified claims (anonymously); regulatory bodies and oversight are largely absent. Complicating matters is the gray area between freedom of speech and misinformation: it is often challenging to distinguish legitimate expressions of opinion from targeted misinformation, but deliberate misinformation is sometimes spread under the guise of freedom of expression, endangering public discourse and democratic processes.

Information processing is the precursor to belief formation, and the investigation of it allows to examine how users process misinformation and why they fall for it (Lutz et al., 2024). The perception and information processing of misinformation on social media has been under-researched, and there is no comprehensive theory addressing how misinformation is received or detected. A notable study by George (2024) sheds light on this issue. In this study, George examined 26 participants who viewed 20 social media posts, both honest and dishonest, on various healthcare topics. Participants were tasked with identifying the truthfulness of the posts and explaining their reasoning, with their gaze tracked via eye-tracking technology. The study aimed to uncover which elements of misinformation lead

viewers to believe a post is true. The findings revealed that the source of the post, the apparent reasonableness of its claims, and the overall look and feel of the post were the most influential factors in their judgments. Nevertheless, existing research offers mixed conclusions about the importance of the source. Some studies highlight its significance: participants spent more time on posts from reputable newspapers rather than tabloids (Sülflow et al., 2018), and experienced higher anxiety and perceived greater crisis severity when corrective information came from government agencies or news media as opposed to an individual Facebook friend (van der Meer & Jin, 2020). On the other hand, other studies have found the source to be less critical in evaluating misinformation (Buchanan, 2020; Schaewitz et al., 2020). These latter studies suggest that individual differences are more crucial in assessing the credibility of disinformation than the characteristics of the social media posts themselves.

This study aims to address that research question (RQ):

> *RQ1: What are the differences in the reception process between correct or misinforming social media posts (RQ1a), and what impact does the source of the posts have (RQ1b)?*

The research has examined a wide range of factors of the sender, message, channel, and receiver that influence, if people believe misinformation spread by social media (Tandoc, 2021). Survey studies indicate that greater exposure to social media is associated with greater misinformation beliefs (Allington et al., 2020; De Coninck et al., 2021; Nielsen et al., 2021). Furthermore, those using social media are more likely to state that they have been exposed to COVID-19 misinformation than nonusers (Jurkowitz & Mitchell, 2020; Newman et al., 2020). Surveys confirmed that social media was reported as a frequent source of misinformation (Allington et al., 2020; De Coninck et al., 2021; Kessler et al., 2022; Nielsen et al., 2021).

Misinformation can negatively affect the opinions, emotions, and behavior of believers. Numerous valid studies have representatively researched the dissemination and impact of misinformation on the topic of COVID-19 vaccination (e.g., Loomba et al., 2021; Singh et al., 2022; see also van der Linden, 2022) and the Ukraine war (Geissler et al., 2023; Porter et al., 2023; Wenzel et al., 2024). COVID-19 and the Ukraine war are particularly relevant for studying misinformation and its combat because both involve widespread, impactful misinformation that affects public health and geopolitical stability. Studying these topics helps develop effective strategies to counter misinformation in diverse, high-stakes contexts. Belief in COVID-19 misinformation has posed a global threat to virus containment, as it has been associated with reductions in vaccine intent, preventive behavior, and adherence to government pandemic control guidelines, among other factors (Bertin et al., 2020; Freeman et al., 2022; Juanchich et al., 2021; Roozenbeek et al., 2020). However, the relationship between perception processes and the effect of misinformation is less researched. Studies indicate that reception processes can influence the impact of misinformation (George, 2024; Lutz et al., 2020, 2024; Simko et al., 2019).

The following hypothesis is proposed:

H1: The influence of (mis)informative social media posts on the attitudes of the recipients is affected by their reception processes.

3. Individual information check through online information search

The internet is generally one of the most important sources for information search independent of the topic (Newman et al., 2020). However, misinformation, in particular, is widely disseminated online and especially via social media. Online information search could, therefore, also have negative effects. In general, few people verify the (false) information they find online (Flanagin & Metzger, 2007; Kessler, 2023; Sun, 2022). More (critical) digital information literacy is needed (Brisola & Doyle, 2019; Brørs et al., 2020).

According to the selective-exposure theory, individuals consciously or unconsciously select media offers and content in online search that correspond to their own attitudes because they strive to achieve a cognitive congruence (Klapper, 1960). That research is based on Festinger's (1957) theory of cognitive dissonance. Several experimental studies confirm that theory (Hastall & Wagner, 2017; Knobloch-Westerwick & Meng, 2011; Knobloch-Westerwick et al., 2013). However, studies in real internet settings and not artificial websites cannot confirm it and rather assume habitualized, attitude-independent internet search behavior (Kessler & Zillich, 2019).

Taddicken and Wolff (2023) explored search and selection behavior after (inadvertent) exposure to counter-attitudinal misinformation. The exposure to climate-change-denying misinformation decreased acceptance of climate change and its human causes. In the free internet search after stimulus exposure, attitude-confirming anthropogenity-accepting positions and journalistic content dominated users' selection behavior but not search terms. However, far from avoiding counter-attitudinal information, users actively searched for it.

Kessler and Humprecht (2023) examined individual search, selection, and reception processes regarding misinformation about COVID-19 vaccination. In an observational and survey study, they examined the effects of YouTube videos containing misinformation and subsequent online search behavior. Misinformation tended to have negative effects, mostly on unvaccinated participants. However, searches led to more positive attitudes toward vaccination, regardless of vaccination status or prior beliefs. They also analyzed the search process in more detail: individual information search led to positive results. Misinforming content was rarely selected and perceived, and participants were more likely to perceive supportive and mostly neutral information.

Both Kessler and Humprecht (2023) and Taddicken and Wolff (2023) combined eye tracking and screen recording with surveys. The internet searches in the studies were only about misinformation and checking it. Kessler and Humprecht (2023) but not Taddicken and Wolff (2023) showed a positive effect of individual online search: Misinformation was identified and its negative effect averted. My aim is to investigate how an information search for checking (self-rated) misinforming or correct social media posts on the topics of COVID-19 and the Ukraine war affects

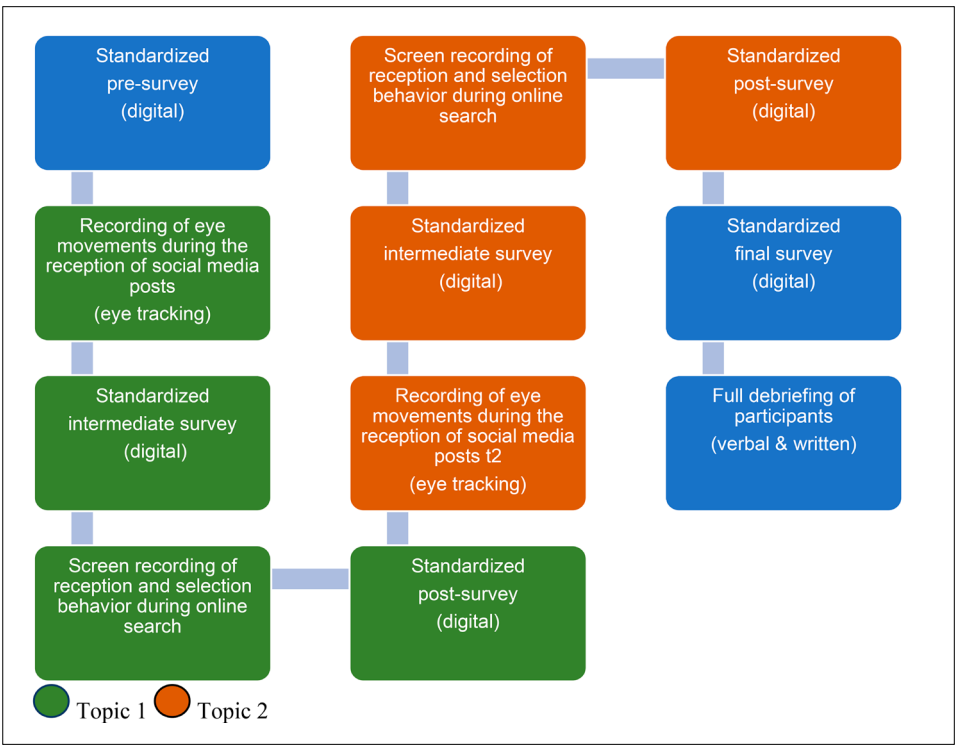
attitudes; the individual search, selection, and reception processes for checking misinformation and correct information should be examined in detail. Little investigation has addressed what online information-seeking to verify perceived (mis) information looks like and its results are.

> *RQ2: What do individual search, selection, and reception processes for checking (mis)informing and correct social media posts look like (RQ2a), and what effect do they have on attitudes of the recipients (RQ2b)?*

4. Methods

In a laboratory experiment using a multimethod design, 86 participants (51% female; two-stage gender, three-stage age, and three-stage education level quotas) from Switzerland were asked to identify misinformation communicated by various sources and check this via online search. Eye tracking was used to record the perception behavior during misinformation identification and screen recording for the search reception and selection behavior. Standardized online surveys measured participants' attitudes at various times (cf. Figure 1).

Figure 1. Multimethod research design from the participants' point of view



Note: duration per person: approx. 1 h.

Participants were recruited via flyers in the city of Zurich, where the study was conducted, and location-specific Facebook groups for classified ads; to fill the quotas for gender, age, and education, the university's study participant server was used. Participants received an expense allowance of CHF 40 ($45), as is customary in the University of Zurich. The experiment averaged one hour per person and was conducted by three assistants (not study author) in January/February 2023. The sample size was calculated using a G-power analysis (Faul et al., 2009).[1]

The topics of misinformation were COVID-19 vaccination and the Ukraine war because these were the most prominent topics in Switzerland in the year before the study (Eisenegger & Vogler, 2022) and misinformation on them is disseminated worldwide via social media (OECD, 2022; Pierri et al., 2023; WHO, 2020; Zeng & Chan, 2021). A study addressing misinformation on both COVID-19 and the Ukraine war offers several advantages over single-theme studies. It provides a comprehensive understanding of misinformation dynamics across different crises, highlights similarities and differences, and helps develop more effective, universal, and context-specific strategies for combating misinformation. Artificial posts were first created in social media design, which were communicated by various designated sources of information (see Figures A1–4). Four sources were set in each case: a widely read public service medium (the Swiss *SRF*), a widely read tabloid (the Swiss *Blick*), a political account (Federal Department of Foreign Affairs Switzerland or Federal Office of Public Health Switzerland), and a science-related account (Institute of Medical Virology or Political Science of the University of Zurich). Participants received four posts with correct information and four with misinformation (scientifically refuted or substantiated statements about COVID-19 vaccination and eyewitness reports and journalistically refuted or confirmed statements about the Ukraine war) (see Table 2, columns 1–2). All misinforming statements had thus already been disseminated and refuted by fact-checking organizations, such as correctiv.org. The statements were determined via a pretest consisting of 24 statements, which were evaluated for comprehensibility, credibility (scale with five items according to Roberts, 2010), emotionality, familiarity, degree of generality, and correctness (see Table A1).[2]

After an initial questioning about participants' attitudes regarding the relevant topics (see Table A2), they were placed in front of a stationary eye tracker (SensoMotoric Instruments stationary remote system; iView X Red 120 Hz). Data collection began after an initial calibration phase in which the correct eye focus was measured at nine points. For each participant, the data were within an acceptable range (derivation *x*: $M = 0.5$; $SD = 0.2$; derivation *y*: $M = 0.5$; $SD = 0.2$). All 86 par-

1 The sample size was calculated using a G-Power analysis (Faul et al., 2009). The aim is to measure the influence of up to four different variables on the dependent variables of disinformation reception and identification via regression analysis and thereby also identify mean effects ($f2 = .25$) (α error probability = .05; power = .95). Second, an analysis of variance with repeated measures on the dependent variable of attitude should also be able to measure at least medium effects ($f2 = .25$) (α error probability = .05; power = .95).

2 The statements should all be as credible and understandable as possible, have a similar degree of emotionality, familiarity, and degree of generality, and the misinformation should be rated as rather correct and the correct information as rather incorrect. In addition, the statements in German had a similar number of words, so they were similarly long.

ticipants searched the internet for information twice, once for each topic. Participants were given a task: "You will now see four news posts. There is a high probability that at least one of the following news posts on the topic of COVID-19/Ukraine war, is intentionally spread misinformation (fake news). Please read the news posts and then make an assessment." The software randomly selected the posts; reception was recorded via eye tracking (measuring fixations and gaze duration). A questionnaire on the content-related assessment of the posts' correctness was then followed in each thematic case by searching the internet (see Tables A3 and A4). Search behavior was recorded via IMotions' screen-recording software. The participants had no time limit and were free to search anywhere; analyzing online search behavior without external time constraints and in a real online environment leads to higher external validity than approaches used in most studies on online search behavior (Zillich & Kessler, 2019). Google, the most widely used search engine in Switzerland at that time, was set as the start page. Finally, attitudes and attributions of correctness were asked again to see whether the search had led to a change. The exact question items and constructs of the total of six online surveys per person are listed in Tables A2–A7. SoSci-Survey survey software was used. The individual internet searches were analyzed using standardized content analysis (two trained coders; reliability test results of 10% of the sample were satisfactory; see Table A8). In the debriefing, participants were given detailed verbal and written explanations about the experiment and the posts' accuracy levels. The ethics committee of the Faculty of Arts and Social Sciences of the University of Zurich approved the experiment (Ethics Committee Approval Number: 22.10.8).

5. Results

5.1 Descriptives

The majority of respondents were fully vaccinated against COVID-19 and had been infected once. This also corresponds to the average of the Swiss population at the time of the survey (SRF Data, 2022). About one in ten had relatives or acquaintances in Russia or Ukraine. The average political attitude was between right- and left-wing. For both topics, people had mainly searched for information online. Most used social media rather frequent (3.6 on a 5-point scale with 5 = very often and 1 = never) and searched online for information daily to several times daily.

The internet was the most frequently mentioned source of information for both topics in the sample. On average, respondents said they encountered misinformation about both topics on the internet and on social media weekly; most simply ignored it and were annoyed by it. They indicated slightly less frequently that they tried to verify it and the source by further information search. Only very rarely did they report misinformation to the platform provider. This shows that the sample uses social media, where they are potentially confronted with misinformation on the relevant topics. However, in this study, subsequent information searches were enforced. In real life, this does not occur very frequently for every suspected misinformation. Tables A2 and A7 provide the exact values of the sample descriptions.

5.2 RQ1a: Reception process

Using eye tracking, the perception of each set of accurate and misleading posts per topic was examined. On average, the four misleading posts were viewed for 53 seconds (M = 53.2; SD = 22.4; Min = 14.7; Max = 134.0) and the correct posts for 62 seconds (M = 61.5; SD = 32.0; Min = 22.7; Max = 186.8) (see Table A9). The dwell time for individual misleading and accurate posts averaged 17 and 23 seconds, respectively. The average fixation frequency was six and eight times for individual misleading and accurate posts, respectively. The sources were viewed for an average of 8 seconds and fixated three times.

The eye-tracking analysis of gaze behavior yielded the following findings: posts with accurate information were viewed slightly longer and fixated more frequently (ratio 1:1.2). Post content received more fixations and longer gaze times than the sources did (ratio 3:1).

5.3 RQ1b: Impact of the source of the posts on the reception process

Non-journalistic sources (scientific institutes and government agencies) were perceived as more credible in the survey (see Tables A3 and A4), particularly scientific sources (dwell time M = 4; fixations M = 12) and also viewed for longer and fixated more often than tabloids (dwell time M = 2; fixations M = 5; see Table A9). However, even when controlling for initial beliefs, no significant correlation appeared between accuracy assessment and the number or duration of fixations, suggesting that both were independent of accuracy assessments; both were also independent of whether participants generally classified the content as credible.

5.4 H1: Effects of the reception of the posts on recipients' attitudes

No significant correlation between reception behavior and the impact of the (mis) informing posts on the attitudes of the recipients could be detected. Accordingly, there is no support for the proposed H1. For the correct statements, an effect independent of reception behavior could be detected. Individuals who read accurate statements about COVID-19 vaccination tended to be more convinced about it, had more trust in its effectiveness, felt less uncertain, and experienced less fear of it (statistical significance for anxiety reduction; $F(1.79, 75.24) = 3.8$, $p = .031$, $\eta p2 = .08$, $n = 43$; means compared, see Table 1). Similarly, those who read accurate statements about the Ukraine war were also slightly more convinced, in terms of mean differences, that Russia deliberately and unlawfully attacked Ukraine and exhibited less fear (statistical significance for anxiety reduction; $F(2,80) = 10.74$, $p < .001$, $\eta p2 = .21$, $n = 41$; means compared). Overall, for both topics, misleading posts were rated as less correct (see Table 1).

Table 1. Attitude toward COVID-19 and the Russia–Ukraine War

Topic & Correctness of statement	Statements	Pre-survey (t1) *M (SD)*	Intermediate survey (t2) *M (SD)*	Post-survey (t3) *M (SD)*
COVID-19 Misinformation	I believe that vaccination against COVID-19 helps against severe COVID-19 disease.	5.0 (2.1)	5.7 (1.6)	5.6 (1.8)
	I have advised other people before to get vaccinated against COVID-19.	4.2 (2.6)	4.8 (2.1)	4.6 (2.3)
	I am skeptical about the efficacy of the COVID-19 vaccine.	2.8 (1.8)	2.6 (1.8)	2.8 (2.1)
	I trust in the efficacy of the COVID-19 vaccine.	5.0 (1.8)	5.4 (1.8)	5.3 (2.0)
	I am afraid of the COVID-19 vaccine.	2.3 (1.8)	2.1 (1.5)	1.9 (1.5)
	I am uncertain about the efficacy of COVID-19 vaccination.	2.9 (1.9)	2.6 (1.6)	2.7 (2.0)
COVID-19 No misinformation	I believe that vaccination against COVID-19 helps against severe COVID-19 disease.	5.4 (1.9)	5.8 (1.6)	5.9 (1.5)
	I have advised other people before to get vaccinated against COVID-19.	5.5 (1.9)	4.8 (2.3)	4.8 (2.3)
	I am skeptical about the efficacy of the COVID-19 vaccine.	2.7 (1.9)	2.8 (2.0)	2.8 (1.9)
	I trust in the efficacy of the COVID-19 vaccine.	4.9 (1.9)	5.3 (1.8)	5.3 (1.9)
	I am afraid of the COVID-19 vaccine.	2.4 (1.5)	2.0 (1.3)	1.9 (1.4)
	I am uncertain about the efficacy of COVID-19 vaccination.	2.9 (2.0)	3.0 (2.0)	2.6 (1.8)
Ukraine war Misinformation	I believe that Ukraine was targeted and illegitimately attacked by Russia.	5.7 (1.8)	5.7 (1.8)	5.7 (1.8)
	I have told other people before that Russia targeted and illegitimately attacked Ukraine.	3.8 (2.4)	4.4 (2.3)	4.2 (2.4)
	I am skeptical about a targeted and illegitimate attack by Russia on Ukraine.	3.0 (2.0)	2.7 (1.9)	2.5 (1.8)
	I trust that Russia attacked Ukraine in a targeted and illegitimate way.	5.2 (1.8)	5.0 (1.9)	5.4 (1.9)
	I am afraid of targeted and illegitimate attacks by Russia.	3.7 (2.0)	3.7 (2.1)	3.4 (2.1)
	I am uncertain about a targeted and illegitimate attack by Russia on Ukraine.	3.0 (2.0)	2.9 (2.1)	2.7 (1.9)
Ukraine war No misinformation	I believe that Ukraine was targeted and illegitimately attacked by Russia.	5.8 (1.5)	5.9 (1.2)	5.7 (1.5)
	I have told other people before that Russia targeted and illegitimately attacked Ukraine.	3.9 (2.1)	3.6 (2.2)	3.8 (2.3)
	I am skeptical about a targeted and illegitimate attack by Russia on Ukraine.	3.1 (1.9)	2.6 (1.5)	2.5 (1.6)
	I trust that Russia attacked Ukraine in a targeted and illegitimate way.	5.2 (1.8)	5.2 (1.5)	5.2 (1.7)
	I am afraid of targeted and illegitimate attacks by Russia.	4.0 (1.9)	3.4 (1.9)	3.4 (1.9)
	I am uncertain about a targeted and illegitimate attack by Russia on Ukraine.	3.2 (1.8)	2.7 (1.6)	2.9 (1.8)

Notes. $N = 85$. Likert scale from 1 = *do not agree at all* to 7 = *completely agree*.

5.5 RQ2a: Search, selection, and reception processes

In the study, internet searches after reception of accurate or misleading social media posts were captured and analyzed through screen recording and content analysis. All participants conducted two online searches, one for each topic. On average, both searches took approximately 7.5 minutes, and participants visited 9–10 web pages (see Tables A10–A13). Internet search behavior has largely become habitual or accustomed, following a similar pattern. The points of interest now lie in the aspects that differ and whether the search influenced attitudes.

Without including the search engine pages, regarding COVID-19 vaccination, websites of federal agencies and ministries (45%) and print or broadcast media (25%) were frequently accessed, in contrast to scientific journals (3%), fact-checking websites (0.5%), and "alternative media" (0.5%). On average, participants spent 7 minutes searching and visited 9 websites (43% search engine pages). The queries entered into search engines (primarily Google) mostly related to vaccination (77%). Individuals who encountered misinformation were more than twice as likely to include a negative assessment of vaccination in their queries (39% of queries). For instance, they often explicitly searched for vaccine-related harm and deaths. Over 85% of the selected websites were vaccine-related, and in more than half of the cases, these websites exclusively provided a positive evaluation of vaccination. Websites with exclusively negative evaluations were rarely accessed: 3% and 6% for the groups exposed to accurate and misleading posts, respectively. The group that saw misleading posts also more frequently visited websites that were ambivalent (both positive and negative evaluations; 20% vs. 6%) or contained misinformation (2% vs. 0.2%).

Regarding the Ukraine war, websites of print or broadcast media were accessed more frequently (54%) compared to the vaccination topic. Websites of federal agencies and ministries were accessed somewhat less often (17%). Scientific journals were rarely visited (0.2%). Fact-checking websites constituted 7% of the websites but were exclusively visited by the group exposed to misleading posts. On average, participants spent 8 minutes searching and visited 10 websites (45% search engine pages). The selected search results were mostly without explicit evaluations; 95% were related to the Ukraine war, with over half explicitly negatively assessing Russia's role. The group exposed to misleading posts slightly more frequently visited websites that were ambivalent (3% vs. 1%) or contained misinformation (3% vs. 0.2%).

Table 2. Analyses of variance statement evaluation before and after online information search

Topic & correctness assessment	Statement	Analysis of variance with repeated measurement	Bonferroni-corrected pairwise comparisons	Effect size *f* according to Cohen (1988)
COVID-19 Misinformation	The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity.	$F(1,40) = 14.45$, $p < .001$, $\eta_p 2 = .26$, $n = 41$	Significantly more likely to be classified as correct before ($M = 5.10$, $SD = 2.01$) than after ($M = 5.76$, $SD = 1.61$)	0.60 = strong effect
	Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public.	$F(1,38) = 5.895$, $p < .05$, $\eta_p 2 = .134$, $n = 39$	Significantly more likely to be classified as correct before ($M = 4.54$, $SD = 1.95$) than after ($M = 5.13$, $SD = 1.91$)	0.39 = medium to strong effect
	COVID-19 vaccination during pregnancy increases the risk of miscarriage.	$F(1,37) = 18.287$, $p < .001$, $\eta_p 2 = .331$, $n = 38$	Significantly more likely to be classified as correct before ($M = 4.58$, $SD = 2.06$) than after ($M = 6.00$, $SD = 1.64$)	0.70 = strong effect
	The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high.	$F(1,40) = 6.776$, $p < .05$, $\eta_p 2 = .145$, $n = 41$	Significantly more likely to be classified as correct before ($M = 4.61$, $SD = 1.95$) than after ($M = 5.29$, $SD = 1.95$)	0.41 = strong effect

COVID-19 No misinformation	After mRNA vaccination, protection against severe COVID-19 disease is higher than after any natural infection.	$F(1,31) = 9.478$, $p < .05$, $\eta_p 2 = .234$, $n = 32$	Significantly more likely to be classified as false before ($M = 4.34$, $SD = 2.21$) than after ($M = 3.13$, $SD = 2.01$)	0.55 = strong effect
	COVID-19 vaccine protection is stronger at younger ages than at older ages, regardless of vaccine type and viral variant.	$F(1,32) = 0.015$, $p > .05$, $\eta_p 2 = .0$, $n = 33$	Not significantly more likely to be classified as correct or false before ($M = 3.42$, $SD = 2.08$) than after ($M = 3.39$, $SD = 2.25$)	n/a
	COVID-19 disease may occur despite vaccination; general protection against infection has not been evaluated in pivotal trials.	$F(1,35) = 3.408$, $p > .05$, $\eta_p 2 = .089$, $n = 36$	Not significantly more likely to be classified as correct or false before ($M = 2.03$, SD =1.46) than after ($M = 2.56$, $SD = 1.87$)	n/a
	Unvaccinated pregnant women with COVID-19 are more likely to require inpatient intensive care than vaccinated pregnant women and non-pregnant women.	$F(1,31) = 0.284$, $p > .05$, $\eta_p 2 = .009$, $n = 32$	Not significantly more likely to be classified as correct or false before ($M = 2.50$, $SD = 1.57$) than after ($M = 2.41$, $SD = 1.81$)	n/a

Ukraine war Misinformation	NATO had promised Russia that it would not expand eastward, especially into Ukraine.	$F(1,28) = 1.190$, $p > .05$, $\eta_p2 = .041$, $n = 29$	Not significantly more likely to be classified as correct or false before ($M = 4.21$, $SD = 2.01$) than after ($M = 4.66$, $SD = 2.11$)	n/a
	Since the beginning of the war, massive embezzlement of Western and Swiss aid money had been uncovered in Ukraine.	$F(1,22) = 2.477$, $p > .05$, $\eta_p2 = .101$, $n = 23$	Not significantly more likely to be classified as correct or false before ($M = 4.30$, $SD = 1.85$) than after ($M = 5.00$, $SD = 2.02$)	n/a
	NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better.	$F(1,30) = 0.795$, $p > .05$, $\eta_p2 = .026$, $n = 31$	Not significantly more likely to be classified as correct or false before ($M = 4.84$, $SD = 1.95$) than after ($M = 5.10$, $SD = 2.02$)	n/a
	The sanctions against Russia because of the war in Ukraine are having no effect; the West is hurting itself more than Putin.	$F(1,34) = 4.444$, $p < .05$, $\eta_p2 = .116$, $n = 35$	Significantly more likely to be classified as correct before ($M = 3.57$, $SD = 1.899$) than after ($M = 4.17$, $SD = 2.05$)	0.36 = medium to strong effect

Ukraine war No misinformation	Ukraine is not a NATO member and did not meet the criteria for NATO membership before its defensive war began.	$F(1,22) = 0.338$, $p > .05$, $\eta_p2 = .015$, $n = 23$	Not significantly more likely to be classified as correct or false before ($M = 2.52$, $SD = 1.08$) than after ($M = 2.35$, $SD = 1.58$)	n/a
	The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began.	$F(1,20) = 1.628$, $p > .05$, $\eta_p2 = .075$, $n = 21$	Not significantly more likely to be classified as correct or false before ($M = 3.48$, $SD = 2.27$) than after ($M = 3.81$, $SD = 2.09$)	n/a
	The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion.	$F(1,20) = 7.811$, $p < .05$, $\eta_p2 = .281$, $n = 21$	Significantly more likely to be classified as correct before ($M = 3.33$, $SD = 1.43$) than after ($M = 4.14$, $SD = 1.49$)	0.62 = strong effect
	Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law.	$F(1,30) = 2.373$, $p > .05$, $\eta_p2 = .073$, $n = 31$	Not significantly more likely to be classified as correct or false before ($M = 2.77$, $SD = 2.23$) than after ($M = 2.45$, $SD = 2.03$)	n/a

Note. A Likert scale from 1 = *correct* to 7 = *false* was used for all statements.

5.6 RQ2b: Effect of information search

Respondents rated their need to seek further information after stimulus exposure as moderately strong and indicated that their internet search behavior was mostly typical for them (see Tables A3, A4, and A7). They tend to rate their own internet skills quite highly, and most of them searched online at least daily (see Table A2). The search, especially about COVID-19 vaccination, significantly improved misinformation identification (see Table 2): individuals who received the four items of misinformation perceived them all as significantly less correct (strong effects) afterward. Correct information also sometimes appeared to be perceived as even more correct afterward. Similarly, on the Ukraine war, at least one misinformation item was significantly perceived as less correct after a search, but so was one accurate piece of information (a negative effect). No significant effects of the search appeared on general attitudes toward the topics and credibility attributions to the posts' sources (see Table A14).

6. Discussion

This multimethod study's findings provide significant insights into the complex dynamics of (mis)information reception and verification on social media, particularly in critical times shaped by the COVID-19 pandemic (Bertin et al., 2020; WHO, 2020) and the Ukraine war (Pierri et al., 2023; Wenzel et al., 2024). The experimental results underscore the nuanced differences in how individuals process accurate versus misleading posts, and the differences in their subsequent information-seeking behavior.

Through eye tracking, the perception of social media posts was measured. Posts containing accurate information were viewed for slightly longer durations and fixated upon more frequently. This could be because participants exposed only to accurate posts had to deliberate more about the possibility of them also containing misinformation. Lutz et al. (2020) also found similar results regarding the fixation on headlines. Shorter mean fixation durations were associated with greater perceived fakeness and a higher probability of incorrect assessments. Even in a later study by Lutz et al. (2024), it was shown that misleading news stories received fewer eye fixations than accurate news. They explain this by suggesting that participants experience affective responses due to cognitive dissonance when exposed to misinformation as opposed to accurate information. This explanation is supported by Christianson et al. (1991), who analyzed participants' fixation behavior. Their results suggest that participants focusing on emotional content, compared to neutral or unusual content, exhibit shorter fixation durations. Overall, no correlation appeared in this study between fixation number or duration and the subjective assessment of statement accuracy. The statements were perceived with equal intensity. The cognitive decision process to assess their correctness or incorrectness is not correlated with the perception of the posts. The cognitive processes are crucial for the correct identification of misinformation (Lutz et al., 2024). Even other studies indicate that the relationship between the time spent viewing experimental stimuli and the (correct) detection of false information is not clear. Some

studies find evidence that more attention (at least to parts of a post) improves the assessment (George, 2024; Simko et al., 2019), while others find the opposite (Lutz et al., 2020). Future research should focus more on the intra-individual processing routes from the perspective of dual processing theories (see also George, 2024). Understanding how individuals switch between processing routes when assessing information on social media could provide deeper insights into the mechanisms behind misinformation detection and impact.

The results of the study indicate that non-journalistic sources, specifically scientific institutes and government agencies, were perceived as more credible by participants. This perception was also reflected in longer dwell times and more frequent fixations on posts from these sources compared to tabloid sources. However, despite the increased attention given to posts from scientific and governmental sources, there was no significant correlation between the accuracy assessments of these posts and the number or duration of fixations on the sources. While Sülflow et al. (2018) and van der Meer & Jin (2020) highlight the importance of reputable sources, Buchanan (2020) and Schaewitz et al. (2020) suggest the source is less critical. Overall, the current study contributes to the ongoing debate by indicating that while source credibility affects attention, it does not necessarily enhance the accuracy of misinformation detection, underscoring the need for further research to understand the complex dynamics of misinformation perception on social media.

The study showed that a single exposure to misinformation on social media regarding a topic for which participants already held a predisposition had no significant impact on attitudes and was independent of the reception process. About a quarter of the studies measuring the effects of exposure to misinformation on attitudes reached similar conclusions, as shown in the systematic literature review by Schmid et al. (2023). At times, studies only reveal significant effects on specific subgroups, as seen in Kessler and Humprecht (2023). In about 30% of the studies identified by Schmid et al. (2023), significant effects arise after exposure, as also observed in Taddicken and Wolff (2023). An explanation for this variability could be the diversity of misinformation, topics, settings, and stimulus design. Thus, despite the positive outcomes of the current study, the potential of misinformation to influence attitudes should not be underestimated. The experiment showed that a single exposure to information can have a positive effect on attitudes (the effect of posts with correct statements: correct beliefs were strengthened and fear decreased).

The content-analytical assessment of the screen-recording data from online information searches yielded the following summary: search behaviors after exposure to misleading or accurate information did not significantly differ in many aspects. Internet search behavior has largely become habitualized, meaning it follows a consistent pattern due to routine (see Kessler & Humprecht, 2023; Kessler & Zillich, 2019). This is also consistent with the finding that online information search proceeded independently of the prior attitude, which, as in other studies, also contradicts the selective-exposure assumption (cf. Kessler & Humprecht, 2023; Kessler & Zillich, 2019; Taddicken & Wolff, 2023). However, a few distinctions should still be addressed. Individuals exposed to misleading content tended to search for more negative information about vaccination and ambivalent assessments

of Russia's role in the war and engaged with a slightly higher amount of misleading content and fact-checking websites. For COVID-19, information was primarily sourced from government agencies and ministries; a wide range of such content exists, and these pages are often prominently displayed in Google search results. Conversely, for the Ukraine war, the availability of information from government agencies and ministries was limited at the time of the study. Thus, users turned to journalistic sources, which were prominently provided by Google. Overall, fact-checking websites and scientific articles played a minor role in the information search process (see also Schuetz et al., 2021).

The experiment demonstrated that information search can contribute to a better assessment of the correctness of (mis)information. However, this positive effect likely varies by topic, as the availability of reliable information and sources online can differ. This positive effect was notably strong for COVID-19 vaccination, which was also observed in Kessler and Humprecht (2023) on the same subject. Participants became more proficient in distinguishing between correct and false statements after information searches. The supply of reliable sources and information on this topic is incomparably high at the time of the study. However, no meaningful effect was observed for the Ukraine war, as also demonstrated by Taddicken and Wolff (2023) for climate change. For these subjects, the online sources, information, and/or Google's search algorithm are more diverse: it was not the search behavior that was different but the online offering.

6.1 Limitations

A critical factor affecting the generalizability of the findings is that artificial posts were created and presented, each focusing on one topic. The sample size for an eye-tracking study is relatively large, given that each subject spent a minimum of 1 hour. However, a larger sample would be preferable to capture smaller effects (below $f < .25$) and the impacts of significant influencing variables on the effects. The attitude assessment questionnaires employed the same questions thrice, using identical phrasing. This dependent variable might prompt respondents to act more in line with social desirability or defensiveness rather than their natural responses.

Participants were actively encouraged to identify misinformation and verify their assessments through online information searches. This behavior was enforced and might not be as prevalent or extensive in a typical situation after receiving social media posts. The systematic searching documented in the study could be less frequent outside of the laboratory. Moreover, the use of eye tracking and screen recording within the laboratory setting itself presents limitations. Participants are conscious of being observed, which introduces the possibility of conforming to socially desirable behavior that differs from that in an unobserved scenario.

7. Conclusion: Recommendations for action

The study provides insights and recommendations to reduce the spread of misinformation and further enhance users' resilience against it. A promising approach emerges: the battle against misinformation should also involve empowering indi-

viduals to identify it. Whether politically motivated misinformation can negatively impact recipients hinges on recognizing it. Unearthing misinformation on an individual level, at most, yields only a minor detrimental influence on opinion formation. Through personal online searches, users can verify online (mis)information. If they could improve their correctness assessment, this would diminish forwarding and sharing misinformation (Kessler, 2023).

A recommended action for users is to independently verify social media content they find through information research. It is crucial that users possess adequate social media and information literacy, which needs to be individually cultivated and nurtured throughout the lifetime. People should understand which sources provide fact-based information, what defines trustworthy sources, and how to locate them. The work and quality of established fact-checking organizations and their online offerings could also be taught more prominently (see also Schuetz et al., 2021). Additionally, the success of an (often brief) information search can also depend on the topic, as the online landscape varies. For instance, for COVID-19 vaccination, numerous trustworthy and well-researched online platforms offer evidence-based information, prominently displayed at the top of Google search results for easy access. However, with other topics, users might need to engage in more extensive search to access appropriate information and better assess accuracy. For example, searching about the Ukraine war was not always productive and might require an added level of information and search literacy, particularly because ongoing events make independent verification challenging. The recent study by Aslett et al. (2023) also showed that the use of online search engines to evaluate misinformation can increase the likelihood of false information being judged as true. The assumption is that this is because those who search online to evaluate misinformation risk falling into data voids or informational spaces where there is corroborating evidence from low-quality sources. Accordingly, when misinformation circulates on a particular topic, it is advisable to communicate and propagate accurate, fact-based information more extensively through various stakeholders and on diverse platforms, with the support of algorithms if possible.

Acknowledgements

I thank the projects' student assistants Elena Maria Witzgall, Leandra Wildhaber und Damiano Lombardi for their support in the project. Last but not least, I especially thank the editors and reviewers of the journal.

Ethical approval

The study was granted ethical approval by the ethics committee of the Faculty of Arts and Social Sciences of the University of Zürich (Switzerland) on 02.11.2022. The approval number is 22.10.8. Informed consent was obtained from all participants before study participation via printed and signed information sheet and consent forms.

Declaration of conflicting interests

The author declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author received financial support for the research by the Media Authority of North Rhine-Westphalia (Germany).

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APPENDIX

Misinformation on social media: Individual reception and the importance of self-directed internet search for rebuttal

Fehlinformationen in sozialen Medien: Individuelle Rezeption und die Bedeutung eigenständiger Internetsuche zur Widerlegung

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Table A1. Pretest evaluation of selected statements

Topic & statements (*n*)	Statement correct/false	Variables	*M* (*SD*)	Cronbach's Alpha
COVID-19 The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity. (*n* = 127)	false	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	1.99 (1.21) 1.90 (1.17) 1.93 (1.18) 2.86 (1.37) 2.51 (1.31) 2.09 (0.87)	.85
COVID-19 Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public. (*n* = 99)	false	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	2.02 (1.13) 1.99 (1.17) 2.73 (1.29) 3.04 (1.25) 2.27 (1.24) 2.18 (0.86)	.83
COVID-19 COVID-19 vaccination during pregnancy increases the risk of miscarriage. (*n* = 108)	false	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	2.27 (1.27) 1.95 (1.19) 2.78 (1.33) 2.32 (1.20) 2.37 (1.32) 2.48 (0.89)	.81
COVID-19 The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high. (*n* = 114)	false	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	2.22 (1.21) 2.08 (1.29) 2.60 (1.35) 2.97 (1.33) 2.75 (1.25) 2.29 (0.80)	.80
COVID-19 After mRNA vaccination, protection against severe COVID-19 disease is higher than after any natural infection. (*n* = 90)	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	2.86 (1.36) 1.97 (1.14) 2.59 (1.22) 2.48 (1.18) 3.53 (1.13) 2.94 (0.90)	.88
COVID-19 COVID-19 vaccine protection is stronger at younger ages than at older ages, regardless of vaccine type and viral variant. (*n* = 98)	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	2.70 (1.15) 2.43 (1.35) 3.16 (1.24) 2.93 (2.85) 3.68 (1.15) 2.69 (0.97)	.87

COVID-19 COVID-19 disease may occur despite vaccination; general protection against infection has not been evaluated in pivotal trials. (n = 122)	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	3.82 (1.18) 2.03 (1.17) 2.06 (1.04) 2.61 (1.16) 3.63 (1.23) 3.26 (0.94)	.89
COVID-19 Unvaccinated pregnant women with COVID-19 are more likely to require in-patient intensive care than vaccinated pregnant women and non-pregnant women. (n = 103)	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	3.60 (1.24) 2.26 (1.25) 2.98 (1.27) 2.10 (1.12) 3.14 (1.29) 3.12 (0.90)	.87
Ukraine war The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began. (n = 93)	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	3.40 (1.18) 1.75 (0.93) 2.85 (1.22) 2.79 (1.22) 3.37 (1.10) 3.08 (0.75)	.84
Ukraine war The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion. (n = 72).	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	3.15 (1.18) 2.21 (1.18) 3.55 (1.24) 2.93 (1.17) 3.18 (1.08) 2.81 (0.75)	.83
Ukraine war Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law. (n = 75)	correct	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	3.39 (1.54) 2.37 (1.30) 3.14 (1.31) 2.22 (1.02) 3.04 (1.14) 3.00 (0.85)	.85
Ukraine war NATO had promised Russia that it would not expand eastward, especially into Ukraine. (n = 87)	false	False–correct Comprehensible–incomprehensible Known–unknown Specific–general Emotional–unemotional Attributed credibility	2.99 (1.44) 1.99 (1.05) 2.80 (1.30) 2.52 (1.13) 3.27 (1.15) 2.82 (0.85)	.86

Ukraine war In Ukraine, since the beginning of the war, massive embezzlement of Western. (n = 62)	false	False–correct	2.34 (1.04)	.80
		Comprehensible–incomprehensible	3.73 (1.22)	
		Known–unknown	3.95 (1.06)	
		Specific–general	2.85 (1.19)	
		Emotional–unemotional	2.60 (1.14)	
		Attributed credibility	2.50 (0.68)	
Ukraine war NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better. (n = 112)	false	False–correct	2.20 (1.12)	.80
		Comprehensible–incomprehensible	3.65 (1.32)	
		Known–unknown	2.96 (1.29)	
		Specific–general	2.71 (1.17)	
		Emotional–unemotional	2.85 (1.23)	
		Attributed credibility	2.38 (0.77)	
Ukraine war The sanctions against Russia because of the war in Ukraine are having no effect, the West is hurting itself more than Putin. (n = 85)	false	False–correct	3.02 (1.12)	.84
		Comprehensible–incomprehensible	3.83 (1.13)	
		Known–unknown	2.54 (1.21)	
		Specific–general	3.31 (1.18)	
		Emotional–unemotional	2.59 (1.15)	
		Attributed credibility	2.66 (0.81)	

Note. 5-level semantic differential

Table A2. *Pre-survey (t1): Constructs/variables, exact question wording, items, scale levels, and means*

Construct	Question	Measurement details	Items and characteristics of the measurement	Mean value (standard deviation) or frequency (percent)
Attitude vaccination/ Russia	A. What is your attitude toward vaccination against COVID-19 in general? B. What is your attitude toward Russia with regard to its role in the conflict with Ukraine in general?	Seven-point Likert scale	1 = *completely positive* to 7 = *completely negative*	A. M = 2.7; SD = 1.6 B. M = 6.0; SD = 1.0
Attitude items COVID-19	Please indicate how strongly you agree with each of the following statements.	Six items; seven-point Likert scale: 1 = *strongly disagree* to 7 = *strongly agree*; items randomized	• I believe that vaccination against COVID-19 helps against severe COVID-19 disease. • I have advised other people to get vaccinated against COVID-19 before. • I am skeptical about the effectiveness of the COVID-19 vaccine. • I trust in the effectiveness of the COVID-19 vaccine. • I am afraid of the COVID-19 vaccine. • I am uncertain about the effectiveness of the COVID-19 vaccine.	M_{Belief} = 5.2; SD = 2.0 M_{Advice} = 4.9; SD = 2.4 $M_{SkepticisM\,=}$ 2.7; SD = 1.8 M_{Trust} = 5.0; SD = 1.8 M_{Fear} = 2.3; SD = 1.7 $M_{Uncertainty}$ = 2.9; SD = 1.9
Attitude items Ukraine war	Please indicate how strongly you agree with each of the following statements.	Six items; seven-point Likert scale: 1 = *strongly disagree* to 7 = *strongly agree*; items randomized	• I believe that Ukraine was targeted and illegitimately attacked by Russia. • I have told other people before that Russia targeted and illegitimately attacked Ukraine. • I am skeptical about a targeted and illegitimate attack by Russia on Ukraine. • I trust that Russia attacked Ukraine in a targeted and illegitimate way. • I am afraid of targeted and illegitimate attacks by Russia. • I am uncertain about a targeted and illegitimate attack by Russia on Ukraine.	M_{Belief} = 5.7; SD = 1.7 M_{Advice} = 3.8; SD = 2.2 $M_{SkepticisM\,=}$ 3.0; SD = 1.9 M_{Trust} = 5.2; SD = 1.8 M_{Fear} = 3.9; SD = 1.9 $M_{Uncertainty}$ = 3.1; SD = 1.9
COVID-19-vaccination	Have you been fully vaccinated against COVID-19?	Nominal scale	1 = *Yes*; 2 = *No*	$M_{Vaccinated}$ = 1.1; SD = 0.3
Frequency of social media use	How often do you use social media channels like YouTube, Instagram, Facebook or Twitter to get information?	Five-point Likert scale	1 = *several times a day*; 2 = *daily*; 3 = *weekly*; 4 = *monthly*; 5 = *never*	M = 3.6; SD = 1.2
Credibility of information about COVID-19	I assess the information about COVID-19 vaccination on social media as follows:	Nine items; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • inaccurate–accurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased • comprehensible–incomprehensible • exaggerated–understated • high quality–inferior quality • helpful–unhelpful	$M_{Trustworthiness}$ = 3.6; SD = 1.1 $M_{Fairness}$ = 3.2; SD = 1.0 $M_{Accuracy}$ = 3.5; SD = 1.1 $M_{Completeness}$ = 4.0; SD = 1.0 M_{Bias} = 3.6; SD = 1.2 $M_{Comprehensibility}$ = 2.6; SD = 1.1 $M_{Exaggeration}$ = 2.2; SD = 1.0 $M_{Quality}$ = 3.5; SD = 1.0 $M_{helpful}$ = 3.3; SD = 1.0 M_{Index} = 3.3; SD = 0.7 (α = .841)

Credibility of information on Russia–Ukraine conflict	I assess the information about the conflict between Russia and Ukraine on social media as follows:	Nine items; five-level semantic differential; items randomized.	• trustworthy-not trustworthy • fair-unfair • inaccurate-accurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased-biased • comprehensible - incomprehensible • exaggerated-understated • high-quality-inferior-quality • helpful-unhelpful	M_{Trust} = 3.4; *SD* = 1.0 $M_{Fairness}$ = 3.1; *SD* = 1.0 $M_{Accuracy}$ = 3.6; *SD* = 1.0 $M_{Completeness}$ = 4.0; *SD* = 0.9 M_{Bias} = 3.7; *SD* = 1.1 $M_{Comprehens}$ = 2.7; *SD* = 1.0 $M_{Exaggeration}$ = 2.7; *SD* = 0.8 $M_{Quality}$ = 3.5; *SD* = 1.0 $M_{helpful}$ = 3.3; *SD* = 1.1 M_{Index} = 3.3; *SD* = 0.7 (α= .841)
Internet capability	How would you rate your ability to search specific topics on the internet?	Seven-point Likert scale	1 = *very low* to 7 = *very high*	*M* = 5.5; *SD* = 1.1
Frequency of information search on the internet	How often do you search for information on the internet?	Five-point Likert scale	1 = *several times a day*; 2 = *daily*; 3 = *weekly*; 4 = *monthly*; 5 = *never*	*M* = 1.6; *SD* = 0.7
Gender	Which gender do you feel you belong to?	Nominal scale 1–3	1 = *female*; 2 = *male*; 3 = *diverse*	n_{female}= 43 (51%) n_{male}= 41 (48%) $n_{diverse}$ = 1 (1%)
Education	What was the last education you completed?	Nominal scale 1–10 Educational levels: 1 & 2 = *low* 3 to 5 = *medium* 6 to 9 = *high* 10 = *highest*	1 = No education completed 2 = Compulsory school 3 = Diploma secondary school or vocational preparatory school 4 = Vocational apprenticeship 5 = Matura school 6 = Teacher training college 7 = higher technical and vocational training 8 = higher technical school 9 = university, university of applied sciences (Bachelor, Master) 10 = University (Postdoc or higher)	n_{low} = 7 (8%) n_{mediuM} = 21 (25%) n_{high} = 54 (63%) $n_{highest}$ = 3 (4%)
Age	How old are you?	0–x years	18–x	*M* = 36.7; *SD* = 12.4

Note. *N* = 85. α = Cronbach's α.

Table A3. *Interim survey Ukraine (t2): Constructs/variables, exact question wording, items, scale levels, and means*

Construct	Question	Measurement details	Items and characteristics of the measurement	Mean value and standard deviation
Statements on the Ukraine–Russia conflict	Please rate the following statements in terms of their correctness.	Eight items; seven-point Likert scale: 1 = *correct* to 7 = *false*; items randomized.	• NATO had promised Russia that it would not expand eastward, especially into Ukraine. • Since the beginning of the war, massive embezzlement of Western and Swiss aid money had been uncovered in Ukraine. • NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better. • The sanctions against Russia because of the war in Ukraine are having no effect, the West is hurting itself more than Putin. • Ukraine is not a NATO member and did not meet the criteria for NATO membership before its defensive war began. • The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began. • The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion. • Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law.	M_{NATO} = 4.1; *SD* = 2.0 $M_{Embezzlement}$ = 5.0; *SD* = 1.8 $M_{Control\ Russia}$ = 4.9; *SD* = 2.0 $M_{Sanctions}$ = 3.9; *SD* = 1.8 $M_{NATO\ accession}$ = 2.8; *SD* = 1.8 $M_{Weapons}$ = 3.3; *SD* = 2.2 $M_{Right\text{-}wing}$ = 3.2; *SD* = 1.5 $M_{Ukraine\ regions}$ = 2.7; *SD* = 2.1
Need for information	How great do you rate your need to now inform yourself about the contents of the news item(s) you classified as misinformation on the internet?	Seven-point Likert scale	1 = *strong* to 7 = *weak*	*M* = 3.4; *SD* = 1.7
Credibility SRF News	How do you rate the source of the information?	Five items of Roberts' (2010) credibility scale; five-level semantic differential; items randomized	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased- biased	$M_{Trustworthiness}$ = 1.9; *SD* = 0.8 $M_{Fairness}$ = 2.2; *SD* = 0.9 $M_{Accuracy}$ = 2.1; *SD* = 0.8 $M_{Completeness}$ = 2.5; *SD* = 1.0 M_{Bias} = 2.5; *SD* = 1.1 M_{Index} = 2.2; *SD* = 0.7 (α = .862)

Credibility Blick	How do you rate the source of the information?	Five items of Roberts' (2010) credibility scale; five-level semantic differential; items randomized	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased- biased	$M_{Trustworthiness}$ = 3.8; *SD* = 0.9 $M_{Fairness}$ = 3.5; *SD* = 0.9 $M_{Accuracy}$ = 3.9; *SD* = 0.8 $M_{Completeness}$ = 4.1; *SD* = 0.8 M_{Bias} = 3.5; *SD* = 1.0 M_{Index} = 3.7; *SD* = 0.7 (α = .818)
Credibility Federal Department of Foreign Affairs Switzerland (EDA)	How do you rate the source of the information?	Five items of Roberts' (2010) credibility scale; five-level semantic differential; items randomized	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased- biased	$M_{Trustworthiness}$ = 1.9; *SD* = 0.8 $M_{Fairness}$ = 2.2; *SD* = 0.9 $M_{Accuracy}$ = 2.2; *SD* = 1.0 $M_{Completeness}$ = 2.4; *SD* = 1.0 M_{Bias} = 2.7; *SD* = 1.0 M_{Index} = 2.3; *SD* = 0.8 (α = .859)
Credibility Institute for Political Science at the University of Zurich (IPZ UZH)	How do you rate the source of the information?	Five items of Roberts' (2010) credibility scale; five-level semantic differential; items randomized	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased- biased	$M_{Trustworthiness}$ = 1.7; *SD* = 0.7 $M_{Fairness}$ = 2.0; *SD* = 0.7 $M_{Accuracy}$ = 1.9; *SD* = 0.8 $M_{Completeness}$ = 2.0; *SD* = 0.8 M_{Bias} = 2.1; *SD* = 0.8 M_{Index} = 1.9; *SD* = 0.6 (α = .852)
Attitude Statements Ukraine–Russia Conflict	Please indicate how strongly you agree with the following statements.	Six items; seven-point Likert scale: 1 = strongly disagree to 7 = strongly agree; items randomized	• I believe that Ukraine was targeted and illegitimately attacked by Russia. • I have told other people before that Russia targeted and illegitimately attacked Ukraine. • I am skeptical about a targeted and illegitimate attack by Russia on Ukraine. • I trust that Russia attacked Ukraine in a targeted and illegitimate way. • I am afraid of targeted and illegitimate attacks by Russia. • I am uncertain about a targeted and illegitimate attack by Russia on Ukraine.	$M_{Persuasion}$ = 5.8; *SD* = 1.5 M_{Advice} = 4.0; *SD* = 2.3 $M_{SkepticisM}$ = 2.7; *SD* = 1.7 M_{Trust} = 5.1; *SD* = 1.7 M_{Fear} = 3.6; *SD* = 2.0 $M_{Uncertainty}$ = 2.8; *SD* = 1.9

Note. *N* = 85. α = Cronbach's α.

Table A4. *Interim survey COVID-19 (t2): Constructs/variables, exact question wording, items, scale levels, and means*

Construct	Question	Information about the measurement	Items and characteristics of the measurement	Mean value and standard deviation
Statements COVID-19 vaccination	Please rate the following statements in terms of their correctness.	Eight items; seven-point Likert scale: 1 = *correct* to 7 = *false*; items randomized.	• The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity. • Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public. • COVID-19 vaccination during pregnancy increases the risk of miscarriage. • The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high. • After mRNA vaccination, protection against severe • COVID-19 disease is higher than after any natural infection. • COVID-19 vaccine protection is stronger at younger ages than at older ages, regardless of vaccine type and viral variant. • COVID-19 disease may occur despite vaccination; general protection against infection has not been evaluated in pivotal trials. • Unvaccinated pregnant women with COVID-19 are more likely to require inpatient intensive care than vaccinated pregnant women and non-pregnant women.	$M_{Uncertainty}$ = 5.0; *SD* = 2.0 $M_{Side\ effects}$ = 4.8; *SD* = 1.9 $M_{Miscarriage}$ = 4.6; *SD* = 2.0 $M_{Late\ effects}$ = 4.9; *SD* = 1.8 $M_{Protection\ vaccine}$ = 4.2; *SD* = 2.1 $M_{Protection\ age}$ = 3.7; *SD* = 2.1 $M_{Illness}$ = 2.4; *SD* = 1.7 $M_{Pregnancy}$ = 2.9; *SD* = 1.9
Need for information	How great do you rate your need to now inform yourself about the contents of the news item(s) you classified as misinformation on the internet?	Seven-level semantic differential	1 = *strong* to 7 = *weak*	*M* = 3.7; *SD* = 1.8
Credibility SRF News	How do you assess the source of the information?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased-biased	$M_{Trustworthiness}$ = 2.1; *SD* = 0.9 $M_{Fairness}$ = 2.2; *SD* = 1.0 $M_{Accuracy}$ = 2.2; *SD* = 1.0 $M_{Completeness}$ = 2.5; *SD* = 1.0 M_{Bias} = 2.6; *SD* = 1.0 M_{Index} = 2.3; *SD* = 0.8 (α = .868)

Credibility Blick	How do you assess the source of the information?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased-biased	$M_{Trustworthiness}$ = 3.9; *SD* = 1.0 $M_{Fairness}$ = 3.7; *SD* = 0.9 $M_{Accuracy}$ = 3.9; *SD* = 0.9 $M_{Completeness}$ = 4.1; *SD* = 0.9 M_{Bias} = 3.7; *SD* = 1.1 M_{Index} = 3.8; *SD* = 0.7 (α = .821)
Credibility Federal Office of Public Health Switzerland (BAG)	How do you assess the source of the information?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased-biased	$M_{Trustworthiness}$ = 1.9; *SD* = 0.8 $M_{Fairness}$ = 2.0; *SD* = 0.8 $M_{Accuracy}$ = 1.9; *SD* = 0.8 $M_{Completeness}$ = 2.5; *SD* = 1.0 M_{Bias} = 2.6; *SD* = 1.1 M_{Index} = 2.2; *SD* = 0.7 (α = .854)
Credibility Institute of Medical Virology (IMV)	How do you assess the source of the information?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy-not trustworthy • fair-unfair • accurate-inaccurate • complete (tells the whole story)-incomplete (does not tell the whole story) • unbiased-biased	$M_{Trustworthiness}$ = 1.5; *SD* = 0.6 $M_{Fairness}$ = 1.8; *SD* = 0.7 $M_{Accuracy}$ = 1.5; *SD* = 0.6 $M_{Completeness}$ = 1.8; *SD* = 0.8 M_{Bias} = 2.2; *SD* = 1.1 M_{Index} = 1.7; *SD* = 0.5 (α = .759)
Attitude statements COVID-19	Please indicate how strongly you agree with each of the following statements.	Six items; seven-point Likert scale: 1 = *strongly disagree* to 7 = *strongly agree*; items randomized	• I believe that vaccination against COVID-19 helps against weak COVID-19 disease. • I will advise other people to get vaccinated against • COVID-19. • I am skeptical about the efficacy of the COVID-19 vaccine. • I trust in the efficacy of the COVID-19 vaccine. • I am afraid of the COVID-19 vaccine. • I am uncertain about the efficacy of COVID-19 vaccination.	$M_{Persuasion}$ = 5.7; *SD* = 1.6 M_{Advice} = 4.8; *SD* = 2.2 $M_{SkepticismM}$ = 2.7; *SD* = 1.9 M_{Trust} = 5.3; *SD* = 1.8 M_{Fear} = 2.0; *SD* = 1.4 $M_{Uncertainty}$ = 2.8; *SD* = 1.8

Note. *N* = 85. α = Cronbach's α.

Table A5. *Post-survey Ukraine (t3): Constructs/variables, exact question wording, items, scale levels, and means.*

Construct	Question	Information about the measurement	Items and characteristics of the measurement	Mean value and standard deviation
Statements on the Ukraine-Russia conflict after internet research	Please rate the following statements in terms of their correctness according to your internet research.	Eight items; seven-point Likert scale: 1 = *correct* to 7 = *false*; items randomized.	• NATO had promised Russia that it would not expand eastward, especially into Ukraine. • Since the beginning of the war, massive embezzlement of Western and Swiss aid money had been uncovered in Ukraine. • NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better. • The sanctions against Russia because of the war in Ukraine are having no effect; the West is hurting itself more than Putin. • Ukraine is not a NATO member and did not meet the criteria for NATO membership before its defensive war began. • The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began. • The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion. • Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law.	M_{NATO} = 4.4; *SD* = 2.2 $M_{Embezzlement}$ = 5.0; *SD* = 1.9 $M_{Control\ Russland}$ = 5.2; *SD* = 2.0 $M_{Sanctions}$ = 4.2; *SD* = 2.0 $M_{NATO\ accession}$ = 3.0; *SD* = 2.1 $M_{Weapons}$ = 4.1; *SD* = 2.4 $M_{Rightwing}$= 3.9; *SD* = 1.6 $M_{Ukraine}$ = 2.4; *SD* = 2.0
Internet search statements	Please mark which of the statements you searched for on the internet.	Eight items; five-point Likert scale: 1 = *not searched for at all* to 5 = *intensively searched for*; items randomized	• NATO had promised Russia that it would not expand eastward, especially into Ukraine. • Since the beginning of the war, massive embezzlement of Western and Swiss aid money had been uncovered in Ukraine. • NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better. • The sanctions against Russia because of the war in Ukraine are having no effect; the West is hurting itself more than Putin. • Ukraine is not a NATO member and did not meet the criteria for NATO membership before its defensive war began. • The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began. • The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion. • Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law.	M_{NATO} = 2.5; *SD* = 1.5 $M_{Embezzlement}$ = 2.1; *SD* = 1.4 $M_{Control\ Russia}$ = 2.4; *SD* = 1.4 $M_{Sanctions}$ = 2.1; *SD* = 1.4 $M_{NATO\ accession}$ = 3.1; *SD* = 1.5 $M_{Weapons}$ = 2.7; *SD* = 1.6 $M_{Rightwing}$ = 1.9; *SD* = 1.3 $M_{Ukraine}$ = 2.2; *SD* = 1.5

Credibility SRF News after Internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 2.0; *SD* = 0.9 $M_{Fairness}$ = 2.2; *SD* = 0.9 $M_{Accuracy}$ = 2.2; *SD* = 0.9 $M_{Completeness}$ = 2.5; *SD* = 1.0 M_{Bias} = 2.6; *SD* = 1.1 M_{Index} = 2.3; *SD* = 0.8 (α = .900)
Credibility Blick after Internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 3.8; *SD* = 1.0 $M_{Fairness}$ = 3.4; *SD* = 0.9 $M_{Accuracy}$ = 3.8; *SD* = 0.9 $M_{Completeness}$ = 3.8; *SD* = 1.0 M_{Bias} = 3.6; *SD* = 1.0 M_{Index} = 3.7; *SD* = 0.8 (α = .850)
Credibility EDA after Internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 1.8; *SD* = 0.8 $M_{Fairness}$ = 2.1; *SD* = 0.7 $M_{Accuracy}$ = 2.0; *SD* = 0.9 $M_{Completeness}$ = 2.4; *SD* = 1.0 M_{Bias} = 2.7; *SD* = 1.1 M_{Index} = 2.2; *SD* = 0.7 (α = .854)
Credibility Institute for Political Science of the University of Zurich after Internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 1.7; *SD* = 0.7 $M_{Fairness}$ = 1.9; *SD* = 0.7 $M_{Accuracy}$ = 1.8; *SD* = 0.8 $M_{Completeness}$ = 2.2; *SD* = 1.0 M_{Bias} = 2.1; *SD* = 0.9 M_{Index} = 1.9; *SD* = 0.6 (α = .839)
Attitude statements Ukraine-Russia conflict	Please indicate how strongly you agree with each of the following statements.	Six items; seven-point Likert scale: 1 = *strongly disagree* to 7 = *strongly agree*; items randomized	• I believe that Ukraine was targeted and illegitimately attacked by Russia. • I have told other people before that Russia targeted and illegitimately attacked Ukraine. • I am skeptical about a targeted and illegitimate attack by Russia on Ukraine. • I trust that Russia attacked Ukraine in a targeted and illegitimate way. • I am afraid of targeted and illegitimate attacks by Russia. • I am uncertain about a targeted and illegitimate attack by Russia on Ukraine.	M_{Belief} = 5.7; *SD* = 1.7 M_{Advice} = 4.0; *SD* = 2.3 $M_{SkepticisM}$ = 2.5; *SD* = 1.7 M_{Trust} = 5.3; *SD* = 1.8 M_{Fear} = 3.4; *SD* = 2.0 $M_{Uncertainty}$ = 2.8; *SD* = 1.8

Note. *N* = 85. α = Cronbach's α.

Table A6. *Post-survey COVID-19 (t3): Constructs/variables, exact question wording, items, scale levels, and means*

Construct	Question	Information about the measurement	Items and characteristics of the measurement	Mean value and standard deviation
Statements on COVID-19 vaccination after internet research	Please rate the following statements in terms of their correctness according to your internet research.	Eight items; seven-point Likert scale: 1 = *correct* to 7 = *false*; items randomized.	• The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity. • Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public. • COVID-19 vaccination during pregnancy increases the risk of miscarriage. • The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high. • After mRNA vaccination, protection against severe • COVID-19 disease is higher than after any natural infection. • COVID-19 vaccine protection is stronger at younger ages than at older ages, regardless of vaccine type and viral variant. • COVID-19 disease may occur despite vaccination; general protection against infection has not been evaluated in pivotal trials. • Unvaccinated pregnant women with COVID-19 are more likely to require inpatient intensive care than vaccinated pregnant women and non-pregnant women.	$M_{Uncertainty\ vaccine}$ = 5.6; *SD* = 1.7 $M_{Side\ effects}$ = 5.2; *SD* = 1.8 $M_{Miscarriage}$ = 6.0; *SD* = 1.4 $M_{Late\ effects}$ = 5.4; *SD* = 1.8 $M_{Protection\ vaccine}$ = 3.2; *SD* = 1.9 $M_{Protection\ age}$ = 3.4; *SD* = 2.3 $M_{Illness}$ = 2.6; *SD* = 1.9 $M_{Pregnancy}$ = 2.6; *SD* = 1.9
Internet search statements	Please mark which of the statements you searched for on the internet.	Eight items; five-point Likert scale: 1 = *not searched for at all* to 5 = *intensively searched for*; items randomized	• The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity • Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public. • COVID-19 vaccination during pregnancy increases the risk of miscarriage. • The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high. • After mRNA vaccination, protection against severe • COVID-19 disease is higher than after any natural infection. • COVID-19 vaccine protection is more pronounced at younger ages than at older ages, regardless of vaccine type and viral variant. • COVID-19 disease may occur despite vaccination; general protection against infection has not been established in pivotal trials. • Unvaccinated pregnant women with COVID-19 are more likely to require intensive care than vaccinated pregnant women and non-pregnant women.	$M_{Uncertainty\ vaccine}$= 2.5; *SD* = 1.5 $M_{Side\ effects}$ = 2.2; *SD* = 1.4 $M_{Miscarriage}$ = 3.4; *SD* = 1.5 $M_{Late\ effects}$ = 2.7; *SD* = 1.4 $M_{Protection\ vaccine}$ = 2.6; *SD* = 1.5 $M_{Protection\ age}$ = 2.3; *SD* = 1.5 $M_{Illness}$ = 2.6; *SD* = 1.5 $M_{Pregnancy}$ = 3.3; *SD* = 1.5

Credibility of SRF News according to Internet research	How do you rate the source of the information now that you have done your internet research?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 2.1; *SD* = 1.0 $M_{Fairness}$ = 2.2; *SD* = 1.0 $M_{Accuracy}$ = 2.3; *SD* = 0.9 $M_{Completeness}$ = 2.6; *SD* = 1.0 M_{Bias} = 2.6; *SD* = 1.1 M_{Index} = 2.4; *SD* = 0.8 (α = .900)
Credibility Blick after internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 4.0; *SD* = 0.9 $M_{Fairness}$ = 3.6; *SD* = 0.9 $M_{Accuracy}$ = 3.9; *SD* = 0.8 $M_{Completeness}$ = 4.0; *SD* = 0.8 M_{Bias} = 3.6; *SD* = 0.9 M_{Index} = 3.8; *SD* = 0.7 (α = .855)
Credibility BAG after internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 1.9; *SD* = 0.9 $M_{Fairness}$ = 2.0; *SD* = 0.9 $M_{Accuracy}$ = 1.9; *SD* = 0.9 $M_{Completeness}$ = 2.5; *SD* = 1.2 M_{Bias} = 2.5; *SD* = 1.1 M_{Index} = 2.2; *SD* = 0.7 (α = .797)
Credibility IMV after internet research	How do you rate the source of the information now that you have done your internet search?	Five items from Roberts' (2010) credibility scale; five-level semantic differential; items randomized.	• trustworthy–not trustworthy • fair–unfair • accurate–inaccurate • complete (tells the whole story)–incomplete (does not tell the whole story) • unbiased–biased	$M_{Trustworthiness}$ = 1.6; *SD* = 0.7 $M_{Fairness}$ = 1.8; *SD* = 0.8 $M_{Accuracy}$ = 1.7; *SD* = 0.8 $M_{Completeness}$ = 2.0; *SD* = 0.9 M_{Bias} = 2.2; *SD* = 1.1 M_{Index} = 1.8; *SD* = 0.7 (α = .822)
Attitude statements COVID-19	Please indicate how strongly you agree with each of the following statements.	Six items; seven-point Likert scale: 1 = *strongly disagree* to 7 = *strongly agree;* items randomized	• I believe that vaccination against COVID-19 helps against weak COVID-19 disease. • I will advise other people to get vaccinated against COVID-19. • I am skeptical about the efficacy of the COVID-19 vaccine. • I trust in the efficacy of the COVID-19 vaccine. • I am afraid of the COVID-19 vaccine. • I am uncertain about the efficacy of COVID-19 vaccination.	$M_{Persuasion}$ = 5.8; *SD* = 1.6 M_{Advice} = 4.7; *SD* = 2.3 $M_{SkepticismM}$ = 2.8; *SD* = 2.0 M_{Trust} = 5.3; *SD* = 1.9 M_{Fear} = 1.9; *SD* = 1.4 $M_{Uncertainty}$ = 2.7; *SD* = 1.9

Note. *N* = 85. α = Cronbach's α.

Table A7. *Final survey (t4): Constructs/variables, exact question wording, items, scale levels, and means*

Construct	Question	Information about the measurement	Items and characteristics of the measurement	Mean (standard deviation) or frequency (percent)
Internet search behavior	Did your internet search behavior, the internet searches you just conducted, correspond to your normal/everyday online research behavior?	Seven-point Likert scale	1 = *yes, completely* to 7 = *no, not at all*	M = 3.1; SD = 1.8
Media use COVID-19	Since the start of the Corona pandemic, how often have you sought information about vaccination against COVID-19 through the following channels?	Seven items; five-point Likert scale; 1 = *never* to 5 = *very often*; items randomized	• Television • Radio • Printed daily newspapers, weekly newspapers or magazines • Popular science magazines (e.g., PM, GEO, or S pektrum der Wissenschaft) • Internet • Scientific journals (e.g., Science, Nature, or Lancet) • Conversations with friends and acquaintances	$M_{Television}$ = 3.3; SD = 1.3 M_{Radio} = 3.0; SD = 1.4 $M_{Newspapers}$ = 3.1; SD = 1.3 $M_{Magazines}$ = 1.7; SD = 0.9 $M_{Internet}$ = 4.3; SD = 0.8 $M_{Journals}$ = 1.8; SD = 1.2 $M_{Conversations}$ = 4.0; SD = 0.9
Media use Ukraine-Russia conflict	Since the beginning of the conflict between Russia and Ukraine, how often have you sought information on the topic through the following channels?	Seven items; five-point Likert scale; 1 = *never* to 5 = *very often*; items randomized	• Television • Radio • Printed daily newspapers, weekly newspapers or magazines • Popular science magazines (e.g., Der Spiegel, GEO, or Fokus) • Internet • Scientific journals (e.g., Economist, Nebelspalter, or Cicero) • Conversations with friends and acquaintances	$M_{Television}$ = 3.5; SD = 1.3 M_{Radio} = 2.7; SD = 1.3 $M_{Newspapers}$ = 2.9; SD = 1.3 $M_{Magazines}$ = 1.8; SD = 1.1 $M_{Internet}$ = 3.9; SD = 0.9 $M_{Journals}$ = 1.6; SD = 1.0 $M_{Conversations}$ = 3.4; SD = 1.1
Misinformation COVID-19	Misinformation (Fake News) about the vaccination against COVID-19 you yourself encountered so far A. in general B. on the internet C. on social media	Six-point Likert scale	1 = *hourly*; 2 = *daily*; 3 = *weekly*; 4 = *monthly*; 5 = *semiannually*; 6 = *never before*.	A. M = 3.1; SD = 1.0 B. M = 2.9; SD = 1.1 C. M = 3.0; SD = 1.5

Misinformation Ukraine-Russia conflict	Misinformation (fake news) about the conflict between Russia and Ukraine you yourself encountered so far A. in general B. on the internet C. on social media	Six-point Likert scale	1 = *hourly*; 2 = *daily*; 3 = *weekly*; 4 = *monthly*; 5 = *semiannually*; 6 = *never before*.	A. $M = 3.2$; $SD = 1.1$ B. $M = 3.1$; $SD = 1.2$ C. $M = 3.2$; $SD = 1.1$
Reaction Misinformation	How do you react when you come across news or information about COVID-19 vaccination or the conflict between Russia and Ukraine that you suspect is false?	Seven items; five-point Likert scale; 1 = *never* to 5 = *very often*; items randomized	• I ignore this information. • I point out to others that this information may be incorrect. • I verify this information and the information source by further research. • I report this information to the platform provider • I do not respond to it, but I appreciate it when others correct the information and I then share or like the correction • I am annoyed by such information • I share this information and see how my followers react.	$M_{ignore} = 5.4$; $SD = 1.6$ $M_{indicate} = 3.9$; $SD = 1.9$ $M_{verify} = 4.6$; $SD = 1.8$ $M_{report} = 1.8$; $SD = 1.6$ $M_{others} = 4.0$; $SD = 2.0$ $M_{annoy} = 5.1$; $SD = 1.7$ $M_{share} = 1.2$; $SD = 0.8$
Infection COVID-19	Do you have or have you been infected with coronavirus?	Nominal scale 1 & 2; option: not specified	1 = *Yes*; 2 = *No*	$n_{Yes} = 61$ (73%) $n_{No} = 23$ (27%)
Acquaintances Ukraine	Do you have acquaintances or relatives in Ukraine?	Nominal scale 1 & 2; option: not specified	1 = *Yes*; 2 = *No*	$n_{Yes} = 11$ (13%) $n_{No} = 74$ (87%)
Acquaintances Russia	Do you have acquaintances or relatives in Russia?	Nominal scale 1 & 2; option: not specified	1 = *Yes*; 2 = *No*	$n_{Yes} = 10$ (12%) $n_{No} = 75$ (88%)
Political orientation	How would you rank your own political views?	Five-point Likert scale	1 = *very left* to 5 = *very right*	$M = 2.4$; $SD = 1.0$

Note. $N = 85$. α = Cronbach's α

Table A8. *Reliability test of the content analysis of the screen recordings*

Variable	Attributes	Holsti coefficient	Cohen's Kappa	*n*
Search	1 = first search 2 = second search	1.00	1.00	18
Topic	1 = Ukraine war 2 = COVID-19 vaccination	1.00	1.00	18
File name	String	1.00	1.00	18
Total time of online behavior	in seconds	1.00	1.00	18
Accessed internet pages	in words	.99	.99	117
Number of internet pages visited	as numerical value	.83	.81	18
Category internet pages	1–30	.97	.96	117
Number of search engine pages accessed	as numerical value	.94	.93	18
Total time spent on search engine pages	in seconds	1.00	1.00	18
Search request	in words	1.00	1.00	54
Vaccine reference search request	0 = no reference to vaccination 1 = reference to vaccination	1.00	1.00	54
Vaccination Assessment	0 = no evaluation 1 = (somewhat) positive 2 = (somewhat) negative 3 = both positive and negative	1.00	1.00	54
Reference Ukraine search request	0 = no relation to the conflict in Ukraine 1 = relation to the conflict in Ukraine	1.00	1.00	54
Russia assessment	0 = no evaluation 1 = (somewhat) positive 2 = (somewhat) negative 3 = both positive and negative	.98	.96	54
Search request length	Number of words as numerical value	1.00	1.00	54
Autocomplete	0 = no 1 = yes	.96	.92	54
Number of search requests	as numerical value	.89	.86	18
Teaser hit list	1–x	1.00	1.00	81
Teaser position	1–x	.98	.97	81
Main topic teaser	1–x	.93	.92	81
Vaccination reference teaser	0 = no reference to vaccination 1 = reference to vaccination	.98	.95	81

Vaccination Assessment teaser	0 = no evaluation 1 = (somewhat) positive 2 = (somewhat) negative 3 = both positive and negative	.89	.86	81
Reference Ukraine teaser	0 = no relation to the conflict in Ukraine 1 = relation to the conflict in Ukraine	.98	.95	81
Russia assessment teaser	0 = no evaluation 1 = (somewhat) positive toward Russia 2 = (somewhat) negative toward Russia 3 = both positive and negative	.91	.86	81
Number of teasers	as numerical value	1	1	18
Website	in words	1	1	65
Main topic website	1–x	.83	.82	65
Vaccination reference search request website	0 = no reference to vaccination 1 = reference to vaccination	1	1	65
Vaccination Assessment website	0 = no evaluation 1 = (somewhat) positive 2 = (somewhat) negative 3 = both positive and negative	.80	.77	65
Reference Ukraine search request website	0 = no relation to the conflict in Ukraine 1 = relation to the conflict in Ukraine	.98	.93	65
Russia assessment website	0 = no evaluation 1 = (somewhat) positive toward Russia 2 = (somewhat) negative toward Russia 3 = both positive and negative	.80	.77	65
Misinformation website	0 = no, no misinformation (correct) 1 = yes, misinformation (completely wrong)	1	1	65
Misinformation «half-correct» website	0 = no, no misinformation (half-correct) 1 = yes, misinformation (half-correct)	1	1	65
Time on website	in seconds	.97	.95	65
Number of websites	as numeric value	.94	.93	18

Table A9. *Perception of (mis)information regarding COVID-19 and the Ukraine war*

Topic & Correctness of statement	Statements	Dwell time (DT)/Fixation Count (F)	*M* (*SD*)
COVID-19 Misinformation	Total time of reception (sec.)		52.33 (23.47)
	The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity.	F	17.21 (13.22)
	Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public.	F	20.62 (15.51)
	COVID-19 vaccination during pregnancy increases the risk of miscarriage.	F	15.79 (9.68)
	The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high.	F	20.81 (16.61)
	The COVID-19 vaccines are less safe than conventional vaccines because they were developed too quickly out of necessity.	DT	5.41 (5.05)
	Many of the side effects that occurred in people who received the COVID-19 vaccine were intentionally not disclosed to the public.	DT	6.99 (5.33)
	COVID-19 vaccination during pregnancy increases the risk of miscarriage.	DT	6.83 (5.27)
	The likelihood of unknown late effects in persons vaccinated against COVID-19 with mRNA vaccines is high.	DT	5.4 (5.46)
	SRF	F	6.26 (6.29)
	Blick	F	5.4 (5.46)
	Federal Office of Public Health Switzerland (BAG)	F	6.05 (5.78)
	Institute of Medical Virology (IMV)	F	11.02 (9.41)
	SRF	DT	2.37 (2.35)
	Blick	DT	1.82 (1.91)
	Federal Office of Public Health Switzerland (BAG)	DT	3.82 (3.41)
	Institute of Medical Virology (IMV)	DT	2.01 (1.99)
COVID-19 No misinformation	Total time of reception (sec.)		65.44 (38.39)
	After mRNA vaccination, protection against severe COVID-19 disease is higher than after any natural infection.	F	19.15 (14.74)
	COVID-19 vaccine protection is stronger at younger ages than at older ages, regardless of vaccine type and viral variant.	F	26 (23.34)
	COVID-19 disease may occur despite vaccination; general protection against infection has not been evaluated in pivotal trials.	F	22.73 (18.65)
	Unvaccinated pregnant women with COVID-19 are more likely to require inpatient intensive care than vaccinated pregnant women and non-pregnant women.	F	27.58 (19.38)
	After mRNA vaccination, protection against severe COVID-19 disease is higher than after any natural infection.	DT	5.6 (3.73)
	COVID-19 vaccine protection is stronger at younger ages than at older ages, regardless of vaccine type and viral variant.	DT	9.08 (8.03)
	COVID-19 disease may occur despite vaccination; general protection against infection has not been evaluated in pivotal trials.	DT	7.31 (5.95)
	Unvaccinated pregnant women with COVID-19 are more likely to require inpatient intensive care than vaccinated pregnant women and non-pregnant women.	DT	9.38 (6.69)
	SRF	F	5.05 (4.46)
	Blick	F	6.15 (7.15)
	Federal Office of Public Health Switzerland (BAG)	F	9.03 (8.5)
	Institute of Medical Virology (IMV)	F	9.8 (6.79)
	SRF	DT	1.73 (1.41)
	Blick	DT	2.29 (2.56)
	Federal Office of Public Health Switzerland (BAG)	DT	3.19 (2.86)
	Institute of Medical Virology (IMV)	DT	3.21 (2.14)

Ukraine war Misinformation	Total time of reception (sec.)		54.12 (21.24)
	NATO had promised Russia that it would not expand eastward, especially into Ukraine.	F	19.15 (14.74)
	Since the beginning of the war, massive embezzlement of Western and Swiss aid money had been uncovered in Ukraine.	F	26 (23.34)
	NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better.	F	22.73 (18.65)
	The sanctions against Russia because of the war in Ukraine are having no effect, the West is hurting itself more than Putin.	F	27.58 (19.38)
	NATO had promised Russia that it would not expand eastward, especially into Ukraine.	DT	5.6 (3.73)
	Since the beginning of the war, massive embezzlement of Western and Swiss aid money had been uncovered in Ukraine.	DT	9.08 (8.03)
	NATO wanted to include Ukraine in order to get closer to Russia and to be able to control it better.	DT	7.31 (5.95)
	The sanctions against Russia because of the war in Ukraine are having no effect, the West is hurting itself more than Putin.	DT	9.38 (6.69)
	SRF	F	5.05 (4.46)
	Blick	F	6.15 (7.15)
	Federal department of foreign affairs Switzerland (EDA)	F	9.03 (8.5)
	Institute for Political Science at the University of Zurich (IPZ UZH)	F	9.8 (6.79)
	SRF	DT	1.73 (1.41)
	Blick	DT	2.29 (2.56)
	Federal department of foreign affairs Switzerland (EDA)	DT	3.19 (2.86)
	Institute for Political Science at the University of Zurich (IPZ UZH)	DT	3.21 (2.14)
Ukraine war No misinformation	Total time of reception (sec.)		57.48 (25.57)
	The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion.	F	24.51 (15.4)
	Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law.	F	18.31 (13.98)
	The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began.	F	16.74 (11.55)
	Ukraine is not a NATO member and did not meet the criteria for NATO membership before its defensive war began.	F	23.79 (14.47)
	The actual influence of nationalist and far-right parties in Ukraine was rather small before the Russian invasion.	DT	8.86 (6.87)
	Russia recognizes the Luhansk and Donetsk regions of Ukraine as independent states, in violation of international law.	DT	6.07 (4.36)
	The U.S. and other European countries supplied heavy weapons to Ukraine only after the war with Russia began.	DT	5.91 (4.08)
	Ukraine is not a NATO member and did not meet the criteria for NATO membership before its defensive war began.	DT	8.35 (5.78)
	SRF	F	6.1 (5.49)
	Blick	F	5.38 (6.65)
	Federal department of foreign affairs Switzerland (EDA)	F	9.6 (7.86)
	Institute for Political Science at the University of Zurich (IPZ UZH)	F	14.17 (10.34)
	SRF	DT	2.33 (2.08)
	Blick	DT	1.99 (2.41)
	Federal department of foreign affairs Switzerland (EDA)	DT	3.17 (2.57)
	Institute for Political Science at the University of Zurich (IPZ UZH)	DT	4.93 (4.02)

Note: $N = 85$

Table A10. *Content analysis of the screen recordings on COVID-19 misinformation: Variables, characteristics, frequencies, and means*

Variables	Characteristics	Frequencies *n* (%)	Mean value (standard deviation)
Total length of online behavior	in seconds		450.36 (245.79)
Number of visited internet pages	as numeric value		9.64 (5.348)
Categorization internet page	1 = Search engine page	188 (43.1)	
	2 = Encyclopedias	4 (0.9)	
	3 = Websites of ministries/authorities	52 (11.9)	
	6 = Online presence of a print product (newspaper)	25 (5.7)	
	7 = Online appearance of a TV product	40 (9.2)	
	8 = Online information portal	25 (5.7)	
	9 = University pages	10 (2.3)	
	10 = Social-Media-Sites	2 (0.5)	
	11 = Associations / Networks / NGOs	10 (2.3)	
	12 = Website of the BAG	67 (15.4)	
	14 = Fact-checking websites	1 (0.2)	
	15 = scientific journals	7 (1.6)	
	16 = Alternative media websites	2 (0.5)	
	30 = Other (open)		
Number of search engine pages viewed	as numeric value		4.13 (2.63)
Total time on search engine pages	in seconds		124.69 (84.99)
Vaccination reference of the typed search request	0 = no vaccination reference	45 (24.5)	
	1 = Reference to vaccination	139 (75.5)	
Vaccination assessment	0 = no evaluation	108 (58.7)	
	1 = (somewhat) positive	5 (2.7)	
	2 = (somewhat) negative	71 (38.6)	
	3 = both positive and negative	0 (0.0)	
Length of the search request	as numeric value		4.13 (1.69)
Autocomplete the search request	0 = no	122 (65.9)	
	1 = yes	63 (34.1)	
Total number of searches	as numeric value		4.11 (2.53)
Teaser hit list page	1–x		1.02 (.178)
Teaser position	1–x		3.54 (3.08)
Vaccination reference of the typed search request (teaser level)	0 = no vaccination reference	52 (24.1)	
	1 = Reference to vaccination	164 (75.9)	

Vaccination assessment (teaser level)	0 = no evaluation	150 (69.4)	
	1 = (somewhat) positive	23 (10.6)	
	2 = (somewhat) negative	37 (17.1)	
	3 = both positive and negative	6 (2.8)	
Number of selected teasers	as numeric value		4.87 (2.54)
Vaccination reference of the typed search request (Website level)	0 = no vaccination reference	32 (13.7)	
	1 = Reference to vaccination	201 (86.3)	
Vaccination assessment (Website level)	0 = no evaluation	45 (19.3)	
	1 = (somewhat) positive	129 (55.4)	
	2 = (somewhat) negative	13 (5.6)	
	3 = both positive and negative	46 (19.7)	
Misinformation	0 = no, no misinformation (completely false)	233 (99.1)	
	1 = yes, Misinformation (completely false)	2 (0.9)	
Misinformation „half-correct“	0 = no, no misinformation (half-correct)	233 (99.1)	
	1 = yes, Misinformation (half-correct)	2 (0.9)	
Time on the post	in seconds		54.19 (45.37)
Time on all websites in total	in seconds		284.22 (194.97)
Number of received websites	as numeric value		5.22 (2.67)
Number of received websites Pro vaccinate	as numeric value		2.98 (1.66)
Number of received websites ambivalent/neutral vaccination	as numeric value		1.04 (1.17)
Number of received websites contra vaccination	as numeric value		0.18 (.49)
Time received websites Pro vaccinate	in seconds		184.07 (149.36)
Time received websites ambivalent/neutral vaccination	in seconds		55.58 (80.35)
Time received websites contra vaccination	in seconds		9.18 (29.06)
Number of received websites completely false	as numeric value		0.04 (0.3)
Time received websites completely false	in seconds		2.69 (17.89)
Number of received websites half-truths	as numeric value		0 (0.00)
Time received websites half-truths	in seconds		2.87 (19.23)

Note: $n = 45$

Table A11. *Content analysis of the screen recordings on correct COVID-19 information: Variables, characteristics, frequencies, and means*

Variables	Characteristics	Frequencies *n* (%)	Mean value (standard deviation)
Total length of online behavior	in seconds		417.85 (285.71)
Number of visited internet pages	as numeric value		8.63 (5.99)
Categorization internet page	1 = Search engine page	157 (42.1)	
	2 = Encyclopedias	1 (0.3)	
	3 = Websites of ministries/authorities	49 (13.1)	
	6 = Online presence of a print product (newspaper)	29 (7.8)	
	7 = Online appearance of a TV product	28 (7.5)	
	8 = Online information portal	16 (4.3)	
	9 = University pages	7 (1.9)	
	10 = Social-Media-Sites	1 (0.3)	
	11 = Associations/Networks/NGOs	16 (4.3)	
	12 = Website of the BAG	57 (15.3)	
	15 = scientific journals	6 (1.6)	
	30 = Other (open)		
Number of search engine pages viewed	as numeric value		4.07 (3.36)
Total time on search engine pages	in seconds		118.80 (85.8)
Vaccination reference of the typed search request	0 = no vaccination reference	35 (21.9)	
	1 = Reference to vaccination	125 (78.1)	
Vaccination assessment	0 = no evaluation	118 (73.8)	
	1 = (somewhat) positive	18 (11.3)	
	2 = (somewhat) negative	24 (15.0)	
	3 = both positive and negative	0 (0.0)	
Length of the search request	as numeric value		4.06 (1.77)
Autocomplete the search request	0 = no	0 (0.0)	
	1 = yes	0 (0.0)	
Total number of searches	as numeric value		3.98 (2.83)
Teaser hit list page	1–x		1.04 (.2879
Teaser position	1–x		3.22 (2.36)
Vaccination reference of the typed search request (teaser level)	0 = no vaccination reference	36 (18.8)	
	1 = Reference to vaccination	155 (81.2)	

Vaccination assessment (teaser level)	0 = no evaluation	133 (69.6)	
	1 = (somewhat) positive	34 (17.8)	
	2 = (somewhat) negative	19 (9.9)	
	3 = both positive and negative	5 (2.6)	
Number of selected teasers	as numeric value		4.71 (3.24)
Vaccination reference of the typed search request (Website level)	0 = no vaccination reference	26 (12.4)	
	1 = Reference to vaccination	184 (87.6)	
Vaccination assessment (Website level)	0 = no evaluation	40 (19.0)	
	1 = (somewhat) positive	137 (65.2)	
	2 = (somewhat) negative	6 (2.9)	
	3 = both positive and negative	27 (12.9)	
Misinformation	0 = no, no misinformation (completely false)	210 (100.0)	
	1 = yes, Misinformation (completely false)	0 (0.0)	
Misinformation „half-correct“	0 = no, no misinformation (half-correct)	209 (99.5)	
	1 = yes, Misinformation (half-correct)	1 (0.5)	
Time on the post	in seconds		50.50 (49.82)
Time on all websites in total	in seconds		262.34 (205.64)
Number of received websites	as numeric value		5.12 (3.40)
Number of received websites Pro vaccinate	as numeric value		3.34 (2.39)
Number of received websites ambivalent/neutral vaccination	as numeric value		0.66 (0.97)
Number of received websites contra vaccination	as numeric value		0.15 (.42)
Time received websites Pro vaccinate	in seconds		188.00 (164.11)
Time received websites ambivalent/neutral vaccination	in seconds		31.80 (49.36)
Time received websites contra vaccination	in seconds		5.95 (21.45)
Number of received websites completely false	as numeric value		0 (.00)
Time received websites completely false	in seconds		0 (.00)
Number of received websites Half-truths	as numeric value		0.03 (.16)
Time received websites Half-truths	in seconds		0.40 (2.53)

Note: *n* = 41

Table A12. *Content analysis of the screen recordings on Ukraine war misinformation: Variables, characteristics, frequencies, and means*

Variables	Characteristics	Frequencies *n* (%)	Mean value (standard deviation)
Total length of online behavior	in seconds		458.49 (292.14)
Number of visited internet pages	as numeric value		9.65 (6.02)
Categorization internet page	1 = Search engine page	167 (42.7)	
	2 = Encyclopedias	11 (2.8)	
	3 = Websites of ministries/authorities	30 (7.7)	
	6 = Online presence of a print product	56 (14.3)	
	(newspaper)	65 (16.6)	
	7 = Online appearance of a TV product	22 (5.6)	
	8 = Online information portal	8 (2.0)	
	9 = University pages	11 (2.8)	
	11 = Associations/Networks/NGOs	16 (4.1)	
	14 = Fact-checking websites		
	30 = Other (open)		
Number of search engine pages viewed	as numeric value		4.07 (2.66)
Total time on search engine pages	in seconds		138.51 (107.77)
Reference to the conflict in Ukraine of the search request	0 = no reference to the conflict in Ukraine	20 (11.9)	
	1 = Reference to the conflict in Ukraine	148 (88.1)	
Russia assessment	0 = no evaluation	161 (95.8)	
	1 = (somewhat) positive toward Russia	2 (1.2)	
	2 = (somewhat) negative toward Russia	5 (3.0)	
	3 = both positive and negative	0 (0.0)	
Length of the search request	as numeric value		3.83 (1.61)
Autocomplete the search request	0 = no	115 (68.5)	
	1 = yes	53 (31.5)	
Total number of searches			4.10 (2.61)
Teaser hit list page	1–x		1.04 (.36)
Teaser position	1–x		4.15 (3.50)
Reference to the conflict in Ukraine of the search request (teaser level)	0 = no reference to the conflict in Ukraine	23 (9.1)	
	1 = Reference to the conflict in Ukraine	231 (90.9)	
Russia assessment (teaser level)	0 = no evaluation	243 (95.7)	
	1 = (somewhat) positive toward Russia	1 (0.4)	
	2 = (somewhat) negative toward Russia	10 (3.9)	
	3 = both positive and negative	0 (0.0)	

Number of selected teasers	as numeric value		6.23 (4.66)
Reference to the conflict in Ukraine of the search request (Website level)	0 = no reference to the conflict in Ukraine	13 (6.1)	
	1 = Reference to the conflict in Ukraine	200 (93.9)	
Russia assessment (Website level)	0 = no evaluation	105 (49.3)	
	1 = (somewhat) positive toward Russia	1 (0.5)	
	2 = (somewhat) negative toward Russia	101 (47.4)	
	3 = both positive and negative	6 (2.8)	
Misinformation	0 = no, no misinformation (completely false)	213 (100.0)	
	1 = yes, Misinformation (completely false)	0 (0.0)	
Misinformation „half-correct“	0 = no, no misinformation (half-correct)	206 (96.7)	
	1 = yes, Misinformation (half-correct)	7 (3.3)	
Time on the post	in seconds		53.22 (60.30)
Time on all websites in total	in seconds		282.95 (246.98)
Number of received websites	as numeric value		5.20 (3.42)
Number of received websites pro Russia	as numeric value		.02 (0.16)
Number of received websites ambivalent/neutral Russia	as numeric value		.24 (0.80)
Number of received websites contra Russia	as numeric value		2.49 (2.06)
Time received websites pro Russia	in seconds		0.49 (3.12)
Time received websites ambivalent/neutral Russia	in seconds		9.51 (34.24)
Time received websites contra Russia	in seconds		171.32 (187.87)
Number of received websites completely false	as numeric value		0 (0.00)
Time received websites completely false	in seconds		0 (0.00)
Number of received websites Half-truths	as numeric value		0.12 (.33)
Time received websites Half-truths	in seconds		3.90 (12.68)

Note: $n = 41$

Table A13. *Content analysis of the screen recordings on correct Ukraine war information: Variables, characteristics, frequencies, and means*

Variables	Characteristics	Frequencies *n* (%)	Mean value (standard deviation)
Total length of online behavior	in seconds		536.36 (277.58)
Number of visited internet pages	as numeric value		10.73 (5.50)
Categorization internet page	1 = Search engine page	238 (49.2)	
	2 = Encyclopedias	26 (5.4)	
	3 = Websites of ministries/authorities	40 (8.3)	
	6 = Online presence of a print product (newspaper)	58 (12.0)	
	7 = Online appearance of a TV product	72 (14.9)	
	8 = Online information portal	22 (4.5)	
	9 = University pages	1 (0.2)	
	10 = Social-Media-Sites	5 (1.0)	
	11 = Associations/Networks/NGOs	12 (2.5)	
	13 = Website of the FDA	6 (1.2)	
	14 = Fact-checking websites	3 (0.6)	
	15 = scientific journals	1 (0.2)	
	30 = Other (open)		
Number of search engine pages viewed	as numeric value		5.29 (3.04)
Total time on search engine pages	in seconds		171.64 (101.98)
Reference to the conflict in Ukraine of the search request	0 = no reference to the conflict in Ukraine	27 (11.2)	
	1 = Reference to the conflict in Ukraine	214 (88.4)	
Russia assessment	0 = no evaluation	230 (95.0)	
	1 = (somewhat) positive toward Russia	0 (0.0)	
	2 = (somewhat) negative toward Russia	12 (5.0)	
	3 = both positive and negative	0 (0.0)	
Autocomplete the search request	0 = no	153 (63.2)	
	1 = yes	89 (36.8)	
Total number of searches	as numeric value		5.38 (3.09)
Teaser hit list page	1–x		1.09 (0.59)
Teaser position	1–x		3.64 (2.80)
Reference to the conflict in Ukraine of the search request (teaser level)	0 = no reference to the conflict in Ukraine	22 (7.9)	
	1 = Reference to the conflict in Ukraine	258 (92.1)	

Russia assessment (teaser level)	0 = no evaluation	268 (95.7)	
	1 = (somewhat) positive toward Russia	1 (0.4)	
	2 = (somewhat) negative toward Russia	11 (3.9)	
	3 = both positive and negative	0 (0.0)	
Number of selected teasers	as numeric value		6.30 (3.72)
Website	in words		
Reference to the conflict in Ukraine of the search request (Website level)	0 = no reference to the conflict in Ukraine	11 (4.8)	
	1 = Reference to the conflict in Ukraine	218 (95.2)	
Russia assessment (Website level)	0 = no evaluation	93 (40.6)	
	1 = (somewhat) positive toward Russia	1 (0.4)	
	2 = (somewhat) negative toward Russia	129 (56.3)	
	3 = both positive and negative	6 (2.6)	
Misinformation	0 = no, no misinformation (completely false)	229 (100.0)	
	1 = yes, Misinformation (completely false)	0 (0.0)	
Misinformation „half-correct“	0 = no, no misinformation (half-correct)	229 (100.0)	
	1 = yes, Misinformation (half-correct)	0 (0.0)	
Time on the post	in seconds		63.29 (61.00)
Time on all websites in total	in seconds		323.47 (226.42)
Number of received websites	as numeric value		7.31 (15.97)
Number of received websites pro Russia	as numeric value		.02 (0.15)
Number of received websites ambivalent/neutral Russia	as numeric value		.13 (0.34)
Number of received websites contra Russia	as numeric value		2.87 (1.96)
Time received websites pro Russia	in seconds		1.49 (9.99)
Time received websites ambivalent/neutral Russia	in seconds		8.87 (33.09)
Time received websites contra Russia	in seconds		212.62 (204.38)
Number of received websites completely false	as numeric value		0 (0.00)
Time received websites completely false	in seconds		0 (0.00)
Number of received websites Half-truths	as numeric value		0 (0.00)
Time received websites Half-truths	in seconds		0 (0.00)

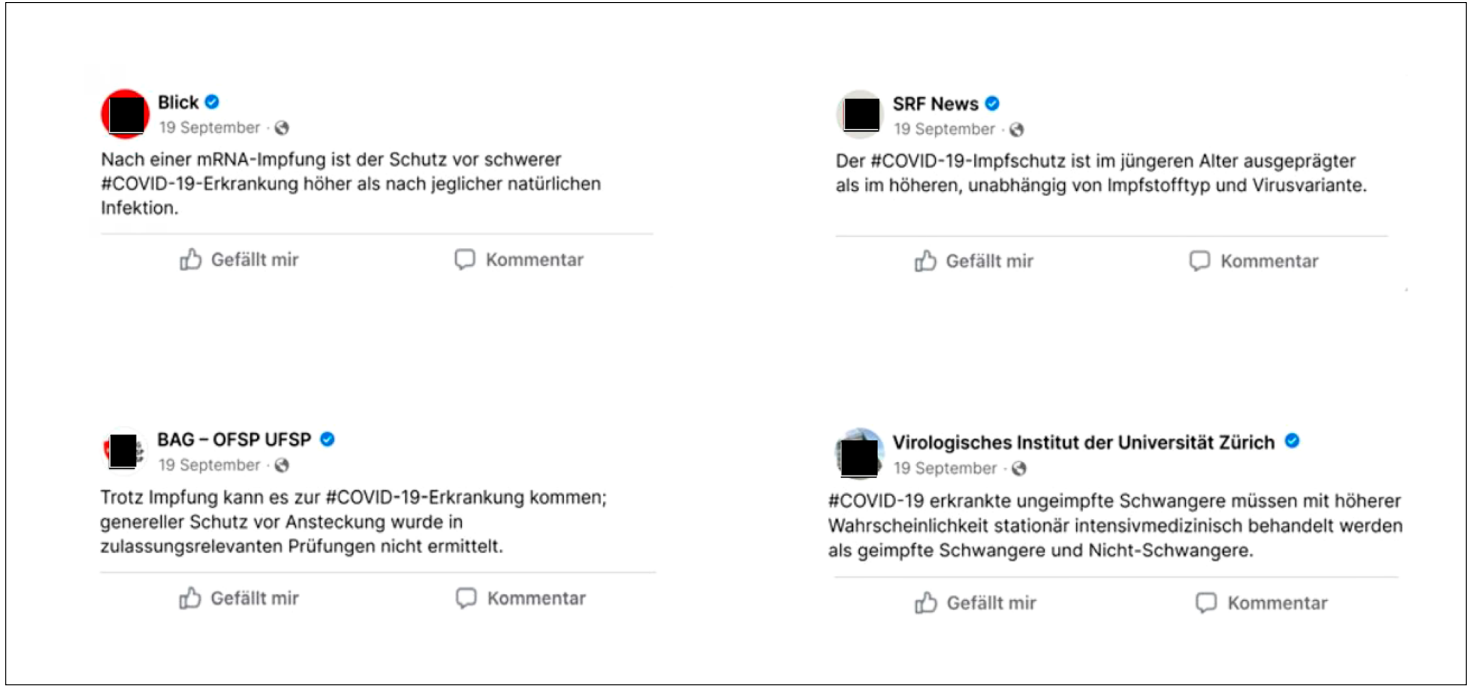
Note: $n = 45$

Table A14. *Credibility of sources before and after online information search*

Topic & correctness assessment	Sources	Before online information search (intermediate survey) *M (SD)*	After online information search (post survey) *M (SD)*
COVID-19 Misinformation	SRF	2.2 (0.7)	2.3 (0.9)
	Blick	4.0 (0.7)	3.9 (0.7)
	BAG	2.1 (0.8)	2.1 (0.8)
	IV UZH	1.7 (0.6)	1.8 (0.7)
COVID-19 No misinformation	SRF	2.5 (0.9)	2.4 (0.8)
	Blick	3.7 (0.7)	3.7 (0.7)
	BAG	2.3 (0.6)	2.3 (0.7)
	IV UZH	1.8 (0.5)	1.8 (0.6)
Ukraine war Misinformation	SRF	2.2 (0.8)	2.3 (0.8)
	Blick	3.7 (0.7)	3.7 (0.7)
	EDA	2.4 (0.8)	2.4 (0.7)
	IPZ UZH	2.0 (0.6)	2.1 (0.7)
Ukraine war No misinformation	SRF	2.2 (0.7)	2.2 (0.8)
	Blick	3.8 (0.7)	3.6 (0.8)
	EDA	2.2 (0.7)	2.0 (0.7)
	IPZ UZH	1.8 (0.6)	1.8 (0.6)

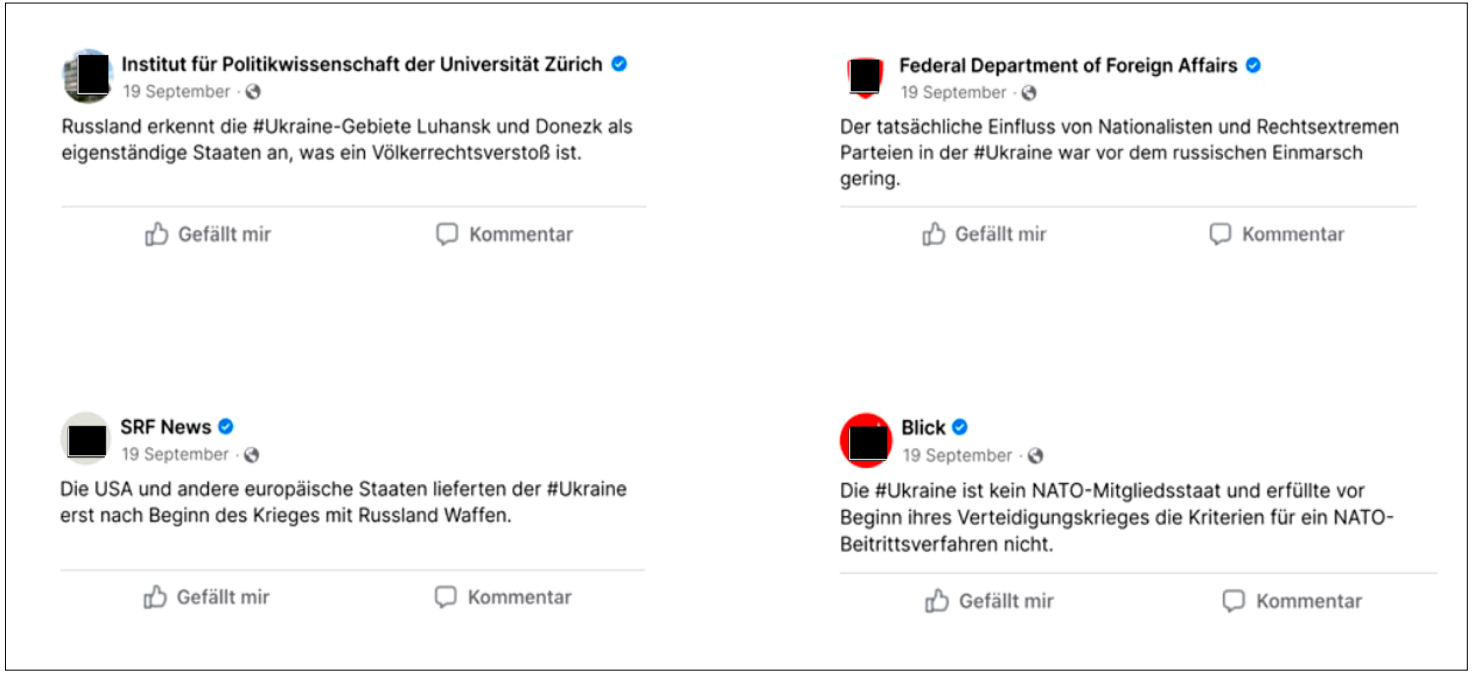
Note. $N = 85$. Semantic differential of 1 = *credible* to 5 = *not credible*.

Figure 1. *Stimulus: COVID-19 correct statements*



Note: Randomized post order, randomized source assignment, randomized topic assignment, and assignment of correct or incorrect posts; logos made unrecognizable for publication for copyright reasons; the size of the stimuli covered the entire screen in the experiment.

Figure 2. *Stimulus: Ukraine war correct statements*



Note: Randomized post order, randomized source assignment, randomized topic assignment, and assignment of correct or incorrect posts; logos made unrecognizable for publication for copyright reasons; the size of the stimuli covered the entire screen in the experiment.

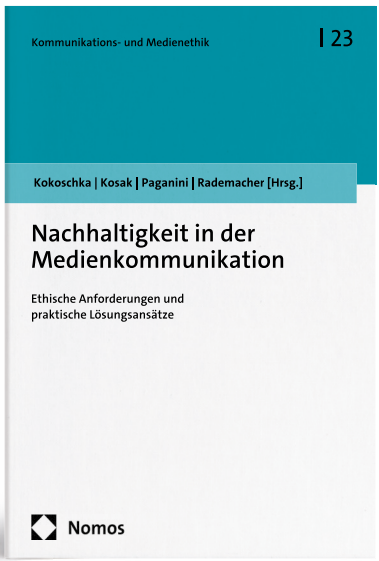
Figure 3. *Stimulus: COVID-19 misinformation statements*

Note: Randomized post order, randomized source assignment, randomized topic assignment, and assignment of correct or incorrect posts; logos made unrecognizable for publication for copyright reasons; the size of the stimuli covered the entire screen in the experiment.

Figure 4. *Stimul:Zus: Ukraine war misinformation statements*

Note: Randomized post order, randomized source assignment, randomized topic assignment, and assignment of correct or incorrect posts; logos made unrecognizable for publication for copyright reasons; the size of the stimuli covered the entire screen in the experiment.

Sustainability from a Media Ethics Perspective



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Nachhaltigkeit in der Medienkommunikation

Ethische Anforderungen und praktische Lösungsansätze

2025, 324 pp., pb., € 84.00
ISBN 978-3-7560-1814-7
E-Book 978-3-7489-4061-6
(Kommunikations- und Medienethik, vol. 23)
In German Language

Several disciplines are concerned with the implementation of sustainable development, including communication and media ethics. This volume presents theoretical analyses and empirical research on the media representation of sustainability and its ethical dimensions. The contributions address topics such as the transformation of journalistic identity, the role of artificial intelligence in sustainability, the communication of sustainability-related content on social media platforms, and the responsibilities of strategic communication in this field. This volume is aimed at communication scholars, students, professionals and interested citizens.

With contributions by

Vanessa Albus | Laura-Maria Altendorfer | Mario Anastasiadis | Janis Brinkmann | Bernhard Debatin | Beatrice Dernbach | Philip Dietrich | Tobias Eberwein | Hektor Haarkötter | Pia Sue Helferich | Brigitte Huber | Sigrid Kannengießer | Lina Kegel | Kathrin Keller | Vanessa Kokoschka | Stefan Kosak | Larissa Krainer | Christina Krakovsky | Alisa Kronberger | Anne Mollen | Mariana Ochoa Moreno | Christian Oggolder | Thomas Pleil | Marlis Prinzing | Lars Rademacher | Torsten Schäfer | Robert Urlacher | Denise Voci | Kristina Wied