

## Patterns of Online Information Seeking and Avoidance about SARS-CoV-2 and COVID-19

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### Abstract

Based on the uncertainty management theory considering different information-based coping strategies that are relevant during health crises, the purpose of the present study is to understand how individuals seek and avoid information during the COVID-19 pandemic. We focus on online information seeking and avoidance because of the high share of people searching for information about the pandemic online and the questionable quality of information about the virus available online. Data for this qualitative exploratory study were collected in semi-structured interviews with 21 participants. Our findings revealed four information-seeking patterns that can be located on a continuum between more active, targeted, and less purposeful acquisitions of information, and three avoidance patterns that are distinguished by different motives to avoid certain information. The findings on specific factors involved in individuals' choices between seeking and avoiding information will help to design better information environments and to identify barriers to the adequate use of information during such crises.

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CC BY 4.0**Elena Link , Magdalena Rosset , Anna Freytag **Department of Journalism and Communication Research, Hanover University of Music,  
Drama and Media, Germany**Abstract**

Based on the uncertainty management theory considering different information-based coping strategies that are relevant during health crises, the purpose of the present study is to understand how individuals seek and avoid information during the COVID-19 pandemic. We focus on online information seeking and avoidance because of the high share of people searching for information about the pandemic online and the questionable quality of information about the virus available online. Data for this qualitative exploratory study were collected in semi-structured interviews with 21 participants. Our findings revealed four information-seeking patterns that can be located on a continuum between more active, targeted, and less purposeful acquisitions of information, and three avoidance patterns that are distinguished by different motives to avoid certain information. The findings on specific factors involved in individuals' choices between seeking and avoiding information will help to design better information environments and to identify barriers to the adequate use of information during such crises.

**Keywords**

Information seeking, information avoidance, uncertainty management theory, COVID-19, online information.

The coronavirus SARS-CoV-2 and the associated respiratory disease, COVID-19, pose a global health challenge, characterised by its unexpected emergence, rapid worldwide spread, an unclear course of the disease, and its inefficient treatment (Liu, 2020). These characteristics have led to unprecedented social, political, and economic measures to combat the pandemic, which amongst others, have given rise to considerable restrictions in social lives. The situation during the early phase of the COVID-19 pandemic seemed to be ambiguous, complex, and

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unpredictable. In particular, the vast volume of information about the pandemic—also described as *infodemic*, meaning “outbreaks of misinformation, rumours, falsehoods” (Eysenbach, 2020, p. 4)—was inconsistent, insufficient, contradictory, and partly unreliable (Zarocostas, 2020). An assumed cause of the infodemic is the unregulated and questionable quality of online information (Cuan-Baltazar et al., 2020; Hernández-García & Giménez-Júlvez, 2020). Social media, in particular, is argued to amplify the problem of misinformation due to its ability to spread information faster and further (Zarocostas, 2020).

All these aspects together underline that health crises such as the COVID-19 pandemic are periods of uncertainty (Tandoc & Lee, 2020). It can be assumed that people perceive medical, scientific, personal, and social uncertainties concerning the pandemic (Babrow, 2001; Brashers et al., 2000; Kim et al., 2020) and are, thereby, challenged to find strategies to cope with these uncertainties (Brashers, 2001; Tandoc & Lee, 2020; Tang & Zou, 2021).

Among a wide range of strategies to cope with uncertainties such as emotional expression or prayer (Lazarus & Folkman, 1984; Taha et al., 2014), the *uncertainty management theory* (UMT; Brashers, 2001) emphasises communication as a means of managing uncertainties, with an emphasis on information seeking and avoidance (Brashers, 2001; Kuang & Wilson, 2017). At its core, the theory postulates that individuals’ appraisal of uncertainty as a negative or positive state determines whether individuals aim to reduce, increase, or maintain their uncertainty through information seeking or avoidance (Barbour et al., 2012; Brashers, 2001; Carcioppolo et al., 2016).

An evaluation of both information seeking and avoidance strategies should consider their individual and strategic consequences. On an individual level, both information seeking and avoidance facilitate individuals’ coping with the uncertainty by reducing negative affective responses and maintaining positive emotions. On a strategic level, information seeking is necessary to inform and educate citizens about how to act appropriately during a health crisis (Johnson & Case, 2012; Lambert & Loiselle, 2007; Liu, 2020; Paakkari & Okan, 2020; Zarocostas, 2020), while information avoidance may delay preventive behaviours or deprive individuals of valuable knowledge for decision-making (Crowley et al., 2021; Golman et al., 2017).

Since coping on an individual level and dissemination of information on a strategic level are among the biggest challenges for individuals and societies in a health crisis (WHO, 2011), the purpose of this study is to build upon the UMT (Brashers, 2001) to understand how individuals seek and avoid online information to cope with the uncertainties related to the COVID-19 pandemic. This is highly relevant as uncertain knowledge at the beginning of the pandemic poses an unprecedented and novel global challenge, in which unsettled individuals are faced with a large amount of (mis-)information potentially inhibiting their coping (Eysenbach, 2020). In addition, COVID-19 as an uncertainty-producing event is unique but not well understood because, unlike other diseases, it does not affect only single individuals or specific subgroups of the population, but is a community-wide experience of uncertainty (Afifi & Afifi, 2021). In addition to providing insights into how individuals cope with this unique challenge, our study also adds to the current literature on the UMT (Brashers, 2001), including using both the information and the method dimension of the health information seeking behaviours (HISB) process (Lambert & Loiselle, 2007; Lenz, 1984) to describe seeking and avoidance patterns in more detail than proposed by the UMT. Characterising the process of HISB more comprehensively is a fruitful supplement to quantitative studies focusing on the prevalence of information seeking and avoidance during the pandemic (e.g., Betsch et al., 2020; Link, 2021;

Soroya et al., 2021; Te Poel et al., 2021) or on the changes in (digital) media usage in general (Bao et al., 2020; Dan & Brosius, 2021; Van Eimeren et al., 2020). By exploring online information seeking and avoidance through 21 semi-structured interviews, our study adds to the extant research by providing insights into individuals' coping strategies, their underlying motives, and information behaviours during health crises, which need to be reflected upon concerning societal prerequisites for combating a pandemic.

## **Uncertainty Management via Information Seeking and Avoidance**

The complexity and ambiguity of health crises like the COVID-19 pandemic are associated with high levels of uncertainty motivating individuals' coping behaviours (Brashers, 2001; Crowley et al., 2021; Tandoc & Lee, 2020). Information seeking and avoidance are two active and conscious strategies that individuals deploy to manage their uncertainty perception in a subjectively useful way (Barbour et al., 2012; Brashers, 2001). The appraisal of uncertainty based on the perceived discrepancy between one's current and desired level of (un)certainty produces emotional responses like anxiety or hope. The emotional response to uncertainty discrepancies is the motivational force determining whether information seeking or avoidance is perceived as an adequate strategy (Afifi & Weiner, 2004; Brashers, 2001; Kuang & Wilson, 2017). If the actual level of uncertainty is higher-than-desired, it is appraised as a negative state associated with anxiety, which individuals aim to reduce; whereas a lower-than-desired appraisal is associated with a positive state of not knowing, which individuals aim to maintain or increase (Brashers, 2001; Kuang & Wilson, 2017). The appraisal and associated goals of uncertainty management are, thus, the motivating underlying factors of information seeking and avoidance.

### *Uncertainty and Information Seeking*

Information seeking is a "purposive acquisition of information from selected information carriers" (Johnson & Meischke, 1993, p. 343). It is a valuable strategy to reduce as well as increase perceived uncertainties. If individuals seek to increase positively assessed uncertainty, they can use information seeking to acquire additional information that may be vague, ambiguous, or contradictory, or they can turn to sources perceived as less credible (Brashers, 2001; Carcioppolo et al., 2016). Alternatively, if uncertainty is negatively assessed, information seeking may reduce uncertainty perceptions.

In the context of the COVID-19 pandemic, seeking information can, for instance, reduce uncertainty and satisfy high information needs by improving knowledge about and comprehension of the pandemic regarding what is happening in one's own region and country. Information seeking fosters empowerment and adaptation to the crisis on a cognitive, behavioural, and affective level, supports sense-making of what the developments mean for oneself, and supports decision-making about preventive behaviours (Betsch et al., 2020; Brashers, 2001; Crowley et al., 2021; Johnson & Case, 2012; Kuang & Wilson, 2017; Lambert & Loiselle, 2007; Li & Zheng, 2020; Van Eimeren et al., 2020). Therefore, it is not surprising that research findings show that the collective attention on information about the pandemic increased after local outbreaks (Bento et al., 2020; Dan & Brosius, 2021; Jurkowitz & Mitchell, 2020; Van Eimeren et al., 2020). Studies on crises in general confirm that individuals are interested to learn about the magnitude of a crisis, to check on the wellbeing of their family

and friends, and to foster emotional support (Austin et al., 2012; Betsch et al., 2020; Fraustino et al., 2018).

However, information seeking also leads to potential risks such as information overload, information anxiety as well as encountering unreliable or false information, for instance (Skarpa & Garoufallou, 2021; Soroya et al., 2021). Moreover, skills like (digital) media and health literacy are necessary in order to benefit from information seeking (Paakkari & Okan, 2020).

### *Uncertainty and Information Avoidance*

Information avoidance is a purposeful decision to “prevent or delay the acquisition of available but potentially unwanted information” (Sweeny et al., 2010, p. 341) and describes behaviours to avoid contact with threatening information (Emanuel et al., 2015; Narayan et al., 2011). In situations characterised by uncertainty, information avoidance can be a more comfortable path to cope with perceived threats (Demetriades & Walter, 2016) by maintaining positively assessed uncertainties. Uncertainty can be positively appraised when information is expected to cause cognitive dissonance (Festinger, 1957; Sweeny et al., 2010), mental discomfort, or obligates undesired changes in beliefs and behaviours (Brashers, 2001; Carcioppolo et al., 2016; Sweeny et al., 2010; Van ’t Riet & Ruiters, 2013). Hence, information avoidance is a strategy to maintain hope and optimism and to cope with emotional burdens (Barbour et al., 2012; Brashers, 2001; Narayan et al., 2011; Van ’t Riet & Ruiters, 2013). However, avoidance can also cause a lack of knowledge and serve as a barrier to protection behaviour (Emanuel et al., 2015).

In addition, information avoidance is associated with uncertainty about information itself (Barbour et al., 2012; Carcioppolo et al., 2016). It is a strategy that is applied if the information or the amount of information is perceived as confusing or overwhelming (Barbour et al., 2012; Carcioppolo et al., 2016; Soroya et al., 2021) or if individuals’ skills to gather, evaluate, and make sense of information seem inadequate (Barbour et al., 2012; Brashers, 2001; Goodall & Reed, 2013). This might be particularly important to consider during an infodemic (Link, 2021; Soroya et al., 2021).

### *The Process of Online Information Seeking and Avoidance*

The UMT (Brashers, 2001) focuses on the triggers of information seeking and avoidance behaviours, while the process of information seeking and avoidance itself receives less attention. Since the UMT describes the existence of many sources of information (Brashers & Hogan, 2013; Rains & Tukachinski, 2015), it seems adequate to characterise information seeking and avoidance more comprehensively by their dimensions, *information*, and *method* (Lambert & Loiselle, 2007; Lenz, 1984), and thereby expand the UMT-perspective. The information dimension considers the type and amount of information being searched for or avoided, whereas the method dimension focuses on the actions individuals use to obtain or avoid information (Galarce et al., 2011; Lambert & Loiselle, 2007).

The Internet is perceived as a noteworthy source of information, particularly when individuals are faced with health challenges (including global health crises), as it provides an easy, convenient, fast, low-cost, needs- and problem-oriented and self-determined opportunity to find relevant information and discuss questions with others (e.g., Kreps, 2017; Rains & Tukachinski, 2015; Tandoc & Lee, 2020). Online platforms are perceived as valuable sources

for providing immediate and in-depth crisis information (Austin et al., 2012; Liu, 2020) in an easily and quickly accessible manner (Van Eimeren et al., 2020). Social media is valued for providing experience-based information (Procopio & Procopio, 2007), enabling interpersonal communication relating to the crisis from a distance (Hernandez & Colaner, 2021), and offering emotional support relevant to manage perceived uncertainties (Austin et al., 2012; Stephens & Malone, 2009), but was less often used to acquire political information during the first lockdown in Germany (Van Eimeren et al., 2020).

To summarise, while the Internet and its various offerings allow individuals more control over their purposeful information behaviours, they also enable less purposeful ways of information acquisition (Niederdeppe et al., 2007) that is facilitated by social media (Tandoc & Lee, 2020; Van Velsen et al., 2012).

### *Research Objective*

In line with the UMT (Brashers, 2001), the present study assumes that both information seeking and avoidance are rational strategies for coping with crises like the COVID-19 pandemic. Brashers et al. (2002) understand information seeking and avoidance as balancing acts for individuals who need to achieve multiple goals such as reducing uncertainty around the magnitude of a crisis but also maintaining optimism. The high importance of both information behaviours in order to manage uncertainties during a pandemic, points towards the need to better understand the specific patterns of online information seeking and avoidance. Such patterns can be characterised by the combination of specific motives, types of seeking and avoidance behaviours, selected or avoided information sources, and searched or avoided content. Therefore, our main research questions are:

*Which patterns of online information seeking (RQ1) and online information avoidance (RQ2) about SARS-CoV-2 and COVID-19 can be identified?*

We hereby include and examine both the information and the method dimension of the process of information seeking and avoidance (Galarce et al., 2011; Lambert & Loiselle, 2007).

### **Method**

Since the COVID-19 pandemic was an unprecedented incident, we collected data at the beginning of the pandemic in Germany when there was no in-depth research on information behaviours available yet. We were interested in describing the processes of information seeking and avoidance in detail by using a qualitative research design appropriate to generate insights into new phenomena (Miles et al., 2020). We employed an exploratory qualitative approach based on semi-structured interviews to identify and map patterns of online information seeking and avoidance in the greatest possible depth and complexity. Moreover, this approach allowed us to elicit the individual experiences of the participants and to capture a broad range of information seeking and avoidance behaviours.

### *Participants*

All authors recruited respondents by directly addressing potential participants in their wider social circle and asking family and friends to contact people in their circles. Convenience sampling was employed because we aimed at gaining an exploratory understanding of a new phenomenon and did not seek generalisation to a population (Saumure & Given, 2017).

However, we tried to obtain maximum variation in the sample in order to capture behaviours and experiences from a wide variety of people in Germany and to identify patterns that are not only prevalent in groups with specific demographics (Miles et al., 2020). The sample varied in terms of gender, age, household size, employment status, living environment, and whether participants belong to a risk group. Information relating to these characteristics was captured as they were assumed to influence uncertainty perceptions during the pandemic. In total, 21 participants with ages ranging from 20 to 78 years participated in the study. The sample reached saturation at this point as only scant new information emerged from the additional interviews (Saumure & Given, 2008). Furthermore, no new categories or subcategories could be identified during the coding procedure. Table 1 provides the demographic characteristics of the participants.

Table 1. Demographic Characteristics of Participants ( $N = 21$ )

	<i>n</i>	%
<b>Gender</b>		
Female	12	57 %
Male	9	43 %
<b>Education</b>		
Certificate of lower secondary education (German: <i>Hauptschulabschluss</i> )	3	14 %
General certificate of upper secondary education (German: <i>Mittlere Reife</i> )	4	19 %
University entrance diploma (German: <i>Abitur</i> )	3	14 %
University degree	11	52 %
<b>Living environment</b>		
Urban (place of residence with a population > 100,000 people)	12	–
Rural (place of residence with a population < 100,000 people)	9	–
<b>Employment status</b>		
In training/studying	2	10 %
Full/part-time employed	11	52 %
Self-employed	3	14 %
Homemaker	1	5 %
Retired	4	19 %
<b>Marital status</b>		
Single	5	24 %
Married	5	24 %
Long-term committed relationship	11	52 %
<b>Living situation</b>		
Living alone	6	29 %
Living with parents	3	14 %
Living with partner/spouse	10	48 %
Living with partner/spouse and child/children	2	10 %
<b>Belonging to a risk group for poor outcomes from COVID-19</b>	8	38 %
	<i>M (SD)</i>	Range
Mean age (in years)	45.0 (19.2)	min = 20.0, max = 78.0
Mean household size (in people)	2.0 (1.1)	min = 1.0, max = 4.0

### *Procedure and Interview Guide*

All 21 semi-structured interviews were conducted by the authors themselves (female communication scientists, working as research assistants, one with a Ph.D., and two Ph.D. students) via telephone during 2-10 April, 2020. On average, the interviews lasted 40 minutes (range: 20-60 minutes). At the beginning of each interview, the study interest—the individual management and perception of the pandemic and the role of information acquisition—was described to the participants. They were informed about the legal and ethical requirements (for example, we addressed voluntariness and anonymity, personally identifiable information, data processing, the purpose of data processing, and right of withdrawal), and requested to provide oral but audio-recorded consent for their participation and audio-record the interview.

The interview guide was developed based on the theoretical background of the UMT (Brashers, 2001) supplemented by the method and information dimension of HISB (Lambert & Loiselle, 2007). The key domains were addressed as open questions by the interviewer. Open-ended questions in the interview guide ranged from general inquiries about the participants' uncertainty perception to more specific questions about information seeking as well as avoidance of media sources. Supplementary questions were used to deepen domains and to maintain a natural flow of conversation. An overview of the interviews' main domains and some exemplary questions of the interview guide are shown in Table 2. The comprehensibility of the interview guide was tested via three pre-test interviews that showed no need for major adjustments, before the implementation. The interview recordings were transcribed verbatim. The data was strictly handled in an anonymous form.

### *Data Analysis*

To analyse the transcripts, we used a qualitative content analysis (Hsieh & Shannon, 2005; Mayring, 2000) with a deductive-inductive combined coding procedure applied by all three authors. The deductive basis considered the major topics and dimensions of the analysis (e.g., “uncertainty perceptions”, “information sources: media”, “information sources: interpersonal”) derived from the interview guide. In the initial phase of the analysis, we identified important meaning units—phrases or paragraphs that contained aspects relevant to the research questions. We labelled those units with codes that remained close to the data. Hereby, the basic structure of the coding scheme was differentiated and modified by developing more specific codes from the participants' single statements (e.g., “information avoidance: death rate in Italy”).

In the second phase of the analysis, inspired by the constant comparative method (Glaser & Strauss, 2006), we grouped the codes into categories (e.g., “types of uncertainty”) and subcategories (e.g., “types of uncertainty: economic”) in an iterative process allowing for ongoing reflection. In the final phase of the analysis, we sought to deduce situation-based patterns of information seeking and avoidance by further looking into the common occurrence of different categories within and across individuals.

In the first phase, the transcripts were divided among the three authors, and we alternately worked on the coding; whereas in the second and final coding phase, everyone worked with all interviews. To ensure mutual agreement between the three authors coding the data, the findings were discussed among the research team at different points in the analysis process. We used the ATLAS.ti software to manage all the data. In the results section, quotations have been chosen for their illustrative power and have been translated verbatim from German to English.

Table 2. List of Main Domains and Questions Covered in the Interviews

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**Experienced uncertainty and risk perception**

- Perception of the current situation as uncertain (specific situations of feeling uncertainty; coping strategies etc.), e.g.,
    - “In what way do you perceive the current situation as uncertain?”
    - “In which situations do you feel uncertain and why?”
    - “How do you handle moments in which you feel especially uncertain? What do you do in such situations?”
  - Risk assessment of infecting oneself with SARS-CoV-2 or of an infection of people in one’s social environment, e.g.,
    - “How do you assess the risk of infecting yourself with the coronavirus?”
- 

**Information seeking**

- Content of information search and motives to seek for this information, e.g.,
    - “What specific questions or issues do you want to find about regarding the coronavirus?”
    - “Why are you particularly interested in these topics?”
  - Sources of information search and reasons to use these sources, e.g.,
    - “Where do you look for information?”
    - “Which particularly good sources would you recommend?”
  - Assessment of need for information and current feeling of being well-informed, e.g.,
    - “How important is it to you to be well informed?”
    - “How do you feel about this feeling [of not feeling well-informed] and how do you deal with it?”
  - Description of information search on an average day, e.g.,
    - “Could you please describe to me how you seek for information about the coronavirus on a normal day (e.g., yesterday)? Let us go through your daily routine together.”
- 

**Information avoiding**

- Feeling of not wanting to know more about the coronavirus (situation, coping strategies etc.), e.g.,
    - “Do you or have you ever had the feeling that you don't really want to know anything more about the coronavirus?”
    - “When was that the case?”, “How did you deal with it?”
  - Avoided content (strategies to deal with unwanted exposure to such content etc.), e.g.,
    - “Are there or were there certain things related to the coronavirus that you don't really want to know about?”
    - “How do you deal with it when you come across these topics - for example in the news or in a conversation?”
  - Avoided sources and reasons for avoiding these sources, e.g.,
    - “Are there certain sources that you intentionally avoid?”
    - “Why do you avoid these sources?”
-

*Table 2.* List of Main Domains and Questions Covered in the Interviews (continued)**Interpersonal communication**

- Used channels to keep in touch with family and friends, e.g.,
  - “How do you keep in touch with your friends and family at the moment?”
- Frequency of contact:
  - “How regularly do you have contact?”
- Assessment of maintaining contact in the current situation, e.g.,
  - “How well do you manage to maintain contacts?”
  - “How has the contact to your friends and family changed due to the coronavirus pandemic?”
- Communication with family and friends about the coronavirus, e.g.,
  - “In what way do you exchange information with your friends and family about the coronavirus?”
  - “Are there any people you don’t talk to about the coronavirus?”

**Results***Patterns of Online Information Seeking about the COVID-19 Pandemic*

To answer RQ1, patterns of online information seeking about the COVID-19 pandemic were identified. Considering uncertainty perceptions as motives of information seeking, types of associated seeking behaviours, used sources, and sought issues, we found four patterns of online information seeking. The identified patterns can be positioned on a continuum from an active, targeted search to a more habitual and less purposeful acquisition of information (see Figure 1). The individual patterns are described in detail below.

**In-Depth Online Information Seeking and Fact-Checking.** The first pattern is categorised as active online information seeking using a variety of online sources to reduce perceived uncertainties: “I deal with uncertainty through conscious information seeking” (31, female). The respondents described search engines as a highly valued access point for information: “Most of the time, when I have seen something interesting or want to know something, I enter it directly into Google” (24, female).

They stressed three major motivations for information seeking: (1) to acquire specific knowledge and search for in-depth, tailored information to reduce uncertainty, (2) to check facts provided in the media or shared by family and friends, and (3) to prepare for interpersonal discussions.

Regarding active seeking for in-depth information, online information seeking was employed supplementary to the use of other media and was triggered by specific interests, unanswered questions, and unmet informational needs. Motivated by the goal of reducing uncertainty and associated anxiety via an information-based assessment of the development of the pandemic, the interviewees reported being particularly interested in current and local infection statistics and international comparisons: “I Google how the developments in Spain or Italy are [...] I inform myself how it is in Germany—in the different federal states” (24, female).

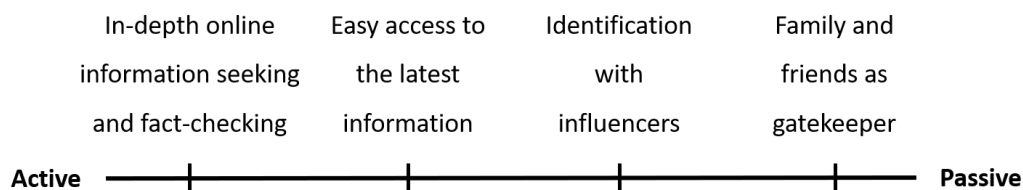


Figure 1. Identified Patterns of Online Information Seeking about the COVID-19 Pandemic

Additionally, economic news was reported as a special issue of interest as interviewees stated that conflicting expert opinions increased their need to learn more about and distinguish between the different points of view about the economic consequences of the pandemic. A 69-years-old male participant said: “I am interested in how economic development is perceived. These are the things I search for on the Internet [because] there are certain uncertainties.”

Additionally, online information was used to check on facts reported in the news or shared by family and friends. One way of dealing with uncertainty about questionable content and potential misinformation was to search for further information on the subject and, in some cases, to correct the information by providing found facts to family and friends: “I often check if it is true by searching myself. I am a little bit sceptical, [...] often I feel uncertain” (43, female).

Further, respondents described that they seek information online to be prepared for and knowledgeable in discussions and follow-up communication. This was, for example, described by an interviewee reporting:

“I want to have background knowledge so that I can say: ‘What you are saying is not true’ or ‘I fully agree with you’. So as not to run naively into something just because someone says it could be so” (43, female).

**Easy Access to the Latest Information.** Compared to the first pattern, the second pattern represents a less targeted, less purposeful type of searching for specific content. It rather represents a ritualised reception of news by scanning information in news apps, media outlets, and social media such as Facebook and Instagram. A characteristic feature of this pattern is that the information on these channels was perceived as easily accessible and available at any time. This was, for example, described by a 32-year-old male respondent, who scanned for the latest information in work breaks or while waiting: “Then at breakfast or lunchtime [...] Haz.de, Zeit.de [news portals of German newspapers] and then quickly scrolled through.”

This pattern is not actively motivated by specific uncertainty discrepancies and emotional responses but is guided by a general need for news monitoring. From some interviewees’ points of view, social media contained the most essential information and the latest news. Hence, the interviewees attributed a filter function to social media platforms: “On Facebook, you always get the news, that’s enough for me” (26, female).

Moreover, social media was attributed a reminder function. For example, an interviewee described how she learned about press conferences and watched them on social media: “The only notification I get is via Facebook when the Robert Koch Institute [the German research institute for disease control and prevention] or the Federal Chancellery holds their press conferences” (30, female).

While the behaviour itself was not triggered by individuals' uncertainty perceptions, the attention allocation to notifications seems to be determined by the desire to feel more in control of the current situation: "You want to be kept up to date. Simply to feel safe again after all. [...] simply to know that you have the matter under control; to take measures for yourself" (32, male).

The areas of interest associated with this information behaviour strongly overlap with the first pattern. Again, the interviewees described themselves as being interested in the statistical development of infection rates. In addition, and motivated by the need to know how to act and what behaviour is prohibited, information on newly enacted governmental directives was of interest: "I just look at what's new, where I'm allowed to go, [...] and how many new infections there are" (26, female).

**Identification with Influencers.** The third pattern is characterised by a focus on influencers as a source of information to cope with specific medical uncertainty perceptions related to the severity of a COVID-19-infection. An interviewee described the insights and experiences of infected influencers in stories and posts on Instagram as highly valuable because the reports helped her to assess the consequences and risks associated with an infection. She further emphasised that these influencers were more in line with her reality and that she was able to better identify with younger influencers than with older people who are often shown in the news: "You don't look at how the 75- or 80-year-olds are doing in the hospital, but I'm interested in how people my age are doing with the disease" (26, female). Since information and experiences were depicted in personal videos from private surroundings, the content was perceived as particularly authentic and credible:

"Because they [influencers] do talk about how they feel being infected. You don't hear it from the media: 'Man, a person is lying there and he has this and that and he feels like this and that.' [...] they really talk into the camera" (26, female).

However, the interviewee did not purposefully search for corresponding videos and posts; instead, she paid more attention to content related to COVID-19 from influencers she already followed.

**Family and Friends as Gatekeepers.** The fourth pattern can be categorised as information sharing by family and friends, who conduct surrogate information seeking and serve as information gatekeepers. Therefore, this pattern is characterised not by the interviewees wanting or seeking information to increase or reduce uncertainty but by their environment sharing information with them. Information sharing was triggered by previous conversations, assumed common interests, the perceived responsibility to care for the other person, or the preparation of subsequent conversations and discussions. The latest news, newspaper articles, expert opinions, and references to the latest changes to governmental directives were forwarded via direct messages or shared in messenger groups: "This morning my mother photographed and send me an article from the newspaper [...] about how to behave" (26, female).

According to the interviewees, the information received and shared in private circles received more consideration than, for example, push notifications from news portals. However, information from familiar senders was examined more critically. An important selection criterion was the source of the message with messages from close family members receiving more attention: "Meanwhile, I sort out because I think 'I don't want to know everything' and I delete messages, but if the information comes from people I know, I read it" (69, male).

The high value attributed to private messages on the latest information is shown by interviewees who described relying on their family and friends to provide them with the most important and latest information: “You hear from friends and colleagues [...]: ‘Have you heard that yet?’ That’s enough information for me” (34, male).

### *Patterns of Online Information Avoidance about the COVID-19 Pandemic*

To answer RQ2, we found three patterns of online information avoidance with respect to the COVID-19 pandemic. The patterns reflect the avoidance of sources and contents (*distancing from sensational and false information*) on the one hand, and the management of a high amount of information (*“digital detox” as a protective measure against information overload and emotional stress*) as well as the omnipresence of the topic over a longer period (*disinterest and information fatigue*) on the other. Hence, the patterns are distinguished by different motivations to avoid information.

**Distancing from Sensational and False Information.** The first avoidance pattern is characterised by the selection and critical assessment of both the source and the content being associated with perceived uncertainties. Some interviewees reported that the large amount of information shared via messenger apps and on social media should be examined critically since there is a high level of scepticism towards laypersons as sources of information. A 33-year-old woman, for example, described social media users generally as “*stupid and ignorant*”. Scepticism towards private messages was justified with concerns about individual opinions which were not based on any expertise, the nondisclosure of the sources of information, and the often-missing critical examination before dissemination of information: “[I avoid] everything from private persons because so many people perhaps do not question: ‘Is this true or not?’, ‘Where does the information come from?’” (24, female).

The content was also critically evaluated because it was partly perceived as sensational and potentially false. In this respect, there was a high level of scepticism about the Internet as a whole and the motivation to protect oneself, as described by a 64-year-old female interviewee: “I try not to inform myself on the Internet because there are too many things in it: Conspiracy theories, nonsense and that only bothers you and I think you have to protect yourself.” Particularly, content-driven scepticism referred to forwarded messages in messenger apps and social media: “You get links from friends. But they are often sensational, which means you have to be very careful with them [...] these are often lurid, one should directly delete those and not look at them” (69, male).

The avoidance of messages and content provided by laypersons was also partly associated with a perceived lack of appropriate information literacy to evaluate information on the pandemic. This was reported by a 78-year-old male interviewee, who preferred to delete the messages or did not use specific channels: “I don’t do it [Social Media]. That’s because there are too many fakes in these Facebook stories and it’s just too hard to distinguish between fake and truth” (78, male).

**‘Digital Detox’ as a Protective Measure Against Information Overload and Emotional Stress.** Compared to the first avoidance pattern, the second pattern is not oriented towards specific sources or content but describes that the amount of information related to the pandemic was perceived as a burden. Motivated by the feeling of information overload and not wanting to know more about the issue, further information about COVID-19 was avoided. This pattern pertained to any source of online information and communication but was more present

particularly with regard to push notifications from news apps or social media. The “*being bombarded*”, as it was called by a 64-year-old female respondent, was perceived as disturbing, unpleasant, and—especially at the beginning of the pandemic—promoted a bad mood, nervousness, and even concentration difficulties:

“You’re just out, less productive, and in a worse mood. Even if you have put down your mobile phone and want to work again, you are not as productive as you would have been if you hadn’t dealt with the latest corona news” (31, female).

Further, the rapid change of information—a characteristic of the infodemic—determined the feeling of never being adequately informed and being overwhelmed by information:

“It is a feeling of swimming carried by uncertainty and the questions ‘What is right?’, ‘What is true?’. There is information that feels good and two days later there is information that calls that into question and uncertainty resonates. [...] I turn to other things, delete such videos because I don’t want to slip into it too much” (46, female).

The emotional burden associated with information around the COVID-19 pandemic was cited as a motive for limiting the time of online media use by defining clear time windows in which information was sought, shared, or exchanged:

“I do it in the morning and in the evening [...] when I hear about corona all the time, then I have already reached a point where I say: ‘That’s enough.’ So, there is a lot of information flood coming at you, if you allow it” (43, female).

Others reported at least news-related or complete online media abstinence, which was associated with a high emotional load. In certain situations, some interviewees described that they needed a counter-balance to the situation and searched for a distraction. This was done by taking a walk, indulging in sports activities, or devoting time to entertaining content instead of information: “Sunday night. That’s when I felt, ‘Enough!’ Then I watched a nice Walt Disney movie with singing and dancing” (44, female).

**Disinterest and Information Fatigue.** Disinterest in information associated with the omnipresence of the COVID-19 pandemic characterises the third pattern. In contrast to the previous pattern, however, this pattern does not focus on excessive demands and emotional stress. The respondents described that their selection of information was rather strongly focused on its high relevance to them. This form of information avoidance, which can be described as information fatigue, was rather motivated by the feeling that no new information is available and that one is provided with a sufficient amount of information: “Well, I don’t see anything new or anything else that is important at the moment” (65, female).

In the course of the pandemic, the interest in information seemed to decrease and the omnipresence of the topic led to information fatigue, which, as described by a 32-year-old male interviewee, could turn into annoyance: “For a while, there was no other topic than corona, which very much annoyed me”. This resulted either in the non-use of information or a more focused engagement with the latest information. As a reaction to this, push notifications were deactivated, more strongly selected, or wiped away unnoticed: “I’m annoyed. Meanwhile, I sort out the breaking news of news apps, but in doubt, they will be wiped away” (33, female).

## Discussion

The purpose of this study was to identify patterns of online information seeking and avoidance understood as relevant strategies to cope with uncertainties during the COVID-19 pandemic. Based on 21 interviews, we aimed to gain insights into different patterns of online information seeking and avoidance built on specific uncertainty perceptions and motivations, and used sources and content.

The study contributed to the current state of research in the following areas: first, it is a merit of the current study to provide an exploratory understanding of HISB during the COVID-19 pandemic as a new phenomenon characterised by new opportunities and challenges of online information seeking and avoidance. Among others, individuals are more than ever before challenged to deal with potentially misleading or false information (Kim et al., 2020). Against this background, a deeper understanding of information behaviours is a key factor for combating the pandemic on an individual and societal level because information seeking and avoidance are both relevant for individuals' decision-making regarding preventive measures as well as for emotion regulation (Brashers, 2001; Crowley et al., 2021; Li & Zheng, 2020). Second, on a theoretical basis, we broaden the view on uncertainty management by considering the information and method dimension of information behaviours and by exploring them through a qualitative approach (Lambert & Loiselle, 2007; Rains & Tukachinsky, 2015). While the findings of our analysis underline the idea of both information seeking and avoidance as strategies to cope with uncertainties that are used in different situations to achieve different goals (Brashers et al., 2002; Tandoc & Lee, 2020), our findings also highlight that considering the information and method dimension as an extension of the UMT was fruitful. We were able to extend the existing knowledge about UMT (Brashers, 2001) by showing that individuals do not use only purposeful information seeking and avoidance behaviours to manage uncertainties (Tandoc & Lee, 2020). Instead, the study highlights the relevance and challenges of the provision of less targeted information on social media, the significance of the social environment for information provision (Hernandez & Colaner, 2021), and the importance of information not purposefully searched for but acquired by information scanning or sharing in managing uncertainty perceptions. The individual patterns will be further interpreted in the following sections.

### *Online Information-Seeking Patterns*

The four identified patterns of online information seeking can be located on a continuum from active to less purposeful types (see Figure 1). The first identified pattern of online information seeking (*in-depth online information seeking and fact-checking*) corresponds to the strategy of an active, targeted information search and highlights the potential of online information seeking to reduce uncertainty and negative emotional responses such as anxiety (Brashers, 2001). According to our results referring to the COVID-19 pandemic, the Internet is, thus, indeed valuable to provide immediate, interest-oriented, and in-depth crisis information (Austin et al., 2012; Liu, 2020). The Internet enables individuals to reduce uncertainties about specific questions through a targeted search (Brashers, 2001; Rains & Tukachinsky, 2015). The majority of the participants described being aware of the amount of misleading and false information about the COVID-19 pandemic available online, and that they also use online searches to verify information from other sources or provided by their social environment. Through this finding, it becomes apparent that some of the respondents are rather sceptical

regarding the information provided by their family and friends. The role of the participants' social environment in motivating seeking in-depth information is further underlined by the result that information seeking is also used to prepare for discussions with family and friends. Thus, our findings suggest that exposure to potential misinformation motivates subsequent online information-seeking behaviours in the context of the COVID-19 pandemic as well (Kim et al., 2020).

Compared to the first pattern, the other three patterns are not triggered by acute uncertainty discrepancies and describe information-seeking behaviours that are less active. In line with current literature (Brashers et al., 2000; Niederdeppe et al., 2007), these patterns represent different types of information scanning or incidental exposure to information which is understood as the information acquisition or openness to potentially relevant information through routine exposure to information sources. These findings illustrate that habitual and passive use of information is very likely in times such as the COVID-19 pandemic because of the ubiquity of available information (Tandoc & Lee, 2020). The second pattern (*easy access to the latest information*), in particular, demonstrates that some participants are rather passive and—for the sake of efficiency or based on the assessment of active information seeking as unnecessary because all information can be gained passively (Lenz, 1984; Zare-Farashbandi & Lalazaryan, 2014)—rely on information selected by algorithms, and use online information in an unconscious, habitual mode (Cohen, 2018). This is a known, and sometimes, efficient attempt to cope with the abundance of online information. However, it can cause negative consequences and challenges such as higher risks of misperceptions or biased opinions (Potter, 2019).

While the source selection is not associated with uncertainty perceptions, the allocation of attention seems to be motivated by general surveillance needs, which is related to general uncertainties and sense-making. The third pattern (*identification with influencers*) represents an addition to the previous, traditional HISB research and to prior research in the context of the COVID-19 pandemic. It illustrates that social media such as Instagram is used because it provides experiences-based, insider information about the suffering caused by COVID-19, which is perceived as particularly authentic, to cope with individual health risks and uncertainties. Through direct access and identification with influencers, uncertainty management based on the formation of attitudes about the risks of the COVID-19 pandemic, and decision-making regarding measures to combat the crisis is facilitated. Although a study by Van Eimeren et al. (2020) shows a reduced relevance of social media as a source for political information during the first lockdown in Germany, compared to the time before the first lockdown, our findings underline the importance of social media with regards to the provision of more experiences-based information. The meaning ascribed to experience-based social media postings illustrates the relevance of social context factors for coping with the crisis, which also becomes evident in the fourth identified pattern (*family and friends as gatekeepers*). This pattern is characterised by family and friends acting as surrogate information seekers and gatekeepers, thus highlighting the important role of family communication in how individuals manage the crisis (Hernandez & Colaner, 2021). This emphasises that the use of online information takes place in and is shaped by a social environment, in which people interact, share information, and even rely on others to manage their uncertainties. The transfer of responsibility to the social environment may be intended to ensure that important information is received, while at the same time one's involvement and emotional burden are reduced.

All three patterns of less purposeful online information seeking are based on information filtered and provided by social media or preselected by family and friends, which are perceived to be more tailored to individual needs, provide the opportunity to interact, and offer emotional and functional support. It can be assumed that from the recipient's perspective, preselection increases the chance to find meaningful information and reduces the risk of increasing uncertainty that further evokes negative feelings (Brashers et al., 2002; Brashers, 2001)—and therefore, provides a good cost-benefit balance of uncertainty management. These findings highlight that not only active information seeking but also the acquisition and sharing of less purposeful types of information, which are less comprehensively considered in the UMT, serve to cope with uncertainties. The relevance of less purposeful information acquisition represents an important learning and an essential step towards bridging the research gap described at the outset.

### *Online Information Avoidance Patterns*

While the identified patterns of online information seeking differ in their degree of activeness, the deduced patterns of online information avoidance rather differ in the method dimension. They differ in their motives and in the measures taken to avoid information. The first pattern of information avoidance (*distancing from sensational and false information*) describes avoiding specific content and sources due to mistrust and scepticism, which reflects the potentially questionable quality of online information on COVID-19 (Cuan-Baltazar et al., 2020; Hernández-García & Giménez-Júlvez, 2020; Kim et al., 2020; Zarocostas, 2020). In line with the current research, information avoidance is identified as a strategy to cope with the uncertainty about the nature of information (Barbour et al., 2012; Carcioppolo et al., 2016). Some of the participants reported being particularly sceptical about content forwarded by laypersons via messengers and social media. Avoidance of content by individuals as a strategy to bypass potentially misleading information is perceived as a beneficial reaction, which reduces risks such as misperceptions or biased decision-making (Barbour et al., 2012; Carcioppolo et al., 2016). However, while individuals tend to avoid information when they are aware that misleading information, rumours, and conspiracy theories are shared online (Zarocostas, 2020), they are also unable to evaluate given information. As a consequence, they are motivated to protect themselves from such information to maintain uncertainties (Barbour et al., 2012; Brashers, 2001). This finding highlights the need to establish a profound level of (digital) media literacy to reduce or prevent the development of informational inequalities.

The second identified pattern (*“digital detox” as a protective measure against information overload and emotional stress*) is focused on information avoidance as a suitable strategy to cope with emotional burdens (Barbour et al., 2012; Narayan et al., 2011) and too much threatening information to avoid an increase in uncertainty due to undesired information (Barbour et al., 2012; Brashers, 2001). Accordingly, abstinence from messages from friends, notifications from news apps, or social media content is described as beneficial for the respondents' wellbeing. It is motivated by the feeling of wanting to avoid information overload, which is in line with previous research (Barbour et al., 2012; Link, 2021; Soroya et al., 2021). Across both the avoidance patterns described so far, online information avoidance is perceived as a short-time beneficial and functional strategy used to cope with negative emotions and to maintain hope. Further, it is applied to overcome information overload by selecting relevant content from credible information sources.

The third pattern focuses on online information avoidance due to information overload over a long time (*disinterest and information fatigue*). Apart from the second pattern, the third pattern is not associated with emotional strains but with a kind of fatigue, as people get tired of omnipresent information on the pandemic and subsequently avoid information as they feel no new information is available. Tang and Zou (2021) come to similar conclusions concerning information-seeking behaviour about COVID-19 over time. Information fatigue might result from long-term or chronic uncertainty in an ongoing pandemic with no certain end (Brashers, 2001; Hernandez & Colaner, 2021). Both disinterest and information fatigue are assessed as being problematic for combating a health crisis with an unpredictable duration, for informing hard-to-reach target groups as well as for raising awareness and compliance for governmental measures to combat the pandemic.

### *Limitations and Further Research*

The results of this study have several limitations. First, we conducted the interviews in the first phase of the pandemic in Germany. Therefore, questions on the evolution or changing of the identified patterns of information behaviours in the later course of the pandemic remain unanswered. Second, our study was unable to explore the long-term consequences of information seeking and avoidance. Third, although we tried to gain a heterogeneous sample with maximum variation, our sample did not include participants who identify as COVID-19 deniers, for instance. Further, a selection bias referring to more information-conscious participants is possible. We tried to prevent the same through a broad introduction of the study interest by asking about people regarding their general perception about and the management of the pandemic. The fact that the sample includes both people who searched for information a lot and those who avoided information completely, shows that we seem to have succeeded in recruiting more and less information-conscious interviewees. Fourth, the findings provide only a first and explorative glimpse on online information behaviours and their underlying motives during the COVID-19 pandemic. Future research is needed to investigate the identified patterns in a larger sample with quantitative data to generalise our results and to test the assumptions of the UMT (Brashers, 2001; Rain & Tukachinsky, 2015) concerning the relevance of seeking and avoidance patterns in coping with health crises—especially regarding less purposeful types of information behaviour to manage uncertainties. However, the inclusion of both the information and the method dimension of information seeking and avoidance seems to be fruitful and necessary to map the process of different information behaviours more comprehensively. Therefore, future research building on the UMT should consider both dimensions to contribute to the extension of the theoretical base of information behaviours in the light of uncertainty. Our study was able to make an important initial contribution to this through its exploratory, open-minded approach, and provides an ideal basis for future studies.

### *Practical Contributions*

The findings on the manner in which people seek certain types of information and avoid others, and the specific factors involved in individuals' information choices can help to design better information environments (Narayan et al., 2011). Besides, they can help to identify barriers to the adequate use of information during a crisis such as the COVID-19 pandemic. Our findings emphasise that rather passive audiences need to be addressed, for example, by using multifunctional platforms such as social media. Further, the relevance of social context factors

such as information automatically filtered and provided by social media or preselected by family and friends should be considered for designing information campaigns and public announcements. Moreover, the emotional burdens and information fatigue caused by information overload or associated with chronic uncertainty seem to be hindering factors in the provision of information. Although information avoidance can be beneficial in some cases, in case of a health crisis such as a pandemic, such a strategy may hamper the adequate supply of information to the public to reach compliance for new measures in combating the pandemic. Hence, it seems to be a major challenge for information campaigns to overcome disinterest and information fatigue as specific barriers to defeat a health crisis. Finally, (digital) media literacy is a distinctive factor in determining whether someone benefits from online information seeking and avoidance behaviours. Our findings point to scepticism regarding information forwarded by family and friends resulting either in the desire to verify information through further information seeking or avoidance. This finding confirms the demands more approaches and interventions to strengthen competencies to evaluate found information and identify misinformation.

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## Conflict of Interest

We have no potential conflict of interest to declare.

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