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# Why do we click? Investigating reasons for user selection on a news aggregator website

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**Abstract:** The aim of this study is to analyze the reasons behind users' selection of news results on the news aggregator website, Google News, and the role that news factors play in this selection. We assume that user's cognitive elaboration of users influences their news selection. In this study, a multi-method approach is used to obtain a complete picture of the users' news selection reasoning: an open survey, a closed survey, and a content analysis of screen recording data. The results were determined from online news selection of 90 news results from 47 users on Google News. Different news values could be identified as relevant for selection: time-referenced news factors and news factors of social significance were shown to be more important than the news factors of deviance. News cues (presence of a picture, position of a news result, source) were identified as selection reasons regardless of the level of cognitive elaboration during the online browsing process.

**Keywords:** online selection reasons, news aggregator website, news selection, news factors, news values

## 1 Introduction

Commonly, when reading online news, people first pick a publisher website and then look for headlines that interest them. By using news aggregator websites, people can discover and access news articles with a wider variety of perspectives from which to select (Google, 2016; Segev, 2010; Sundar, Knobloch-Westerwick, and Hastall, 2007). But what prompts users to select a specific news article from this wide variety?

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On the internet, there is a wide range of news channels and even recently introduced news contexts with specific characteristics that differ from the more traditional news channels. News recipients have to successfully navigate this information overload if they want to be adequately informed. As a part of the use and reception processes of news, selection means filtering or (pre)selecting information in the context of more or less limited personal cognitive processing capacity (Tremel, 2010). Many cognitive processes can be arranged on a continuum ranging from (low elaboration) automatic-unconscious/peripheral to (high elaboration) controlled-conscious/systematic (Phillips, Fletcher, Marks, and Hine, 2016). Depending on the type of elaboration, people are aware of different relevance indicators for the selection of information (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986; Phillips et al., 2016).

Searching for current news on the internet can be done via a general search engine website, via the news website of a media company, via social media, or via a news aggregator website, among others. When using specific search terms on a search engine website, all results contain the same search terms or topics. In the case of news aggregator websites, no conceptual or thematic specification needs to be defined; the results are limited exclusively to journalistic news content. Google News is a free news aggregator provided and operated by Google, selecting up-to-date news from a variety of publications and serving as a key gateway to news for internet users in many countries (Newman, Levy, and Nielsen, 2015; Segev, 2010). Its global spread makes it an influential channel and gatekeeper, which can have important implications for the way its users perceive the world (Segev, 2010). Google News is a computer-generated news service that aggregates the headlines from hundreds of news sources and groups together similar stories (Google, 2016). Here, news is offered in a different way than on the news websites of media companies (e.g., Carlson, 2007; Sundar et al., 2007). One main role of news media is to filter the potential news stories into a purposefully arranged, delimited news product (Carlson, 2007) so that the recipients learn to trust the news selection and arrangement of print and online newspapers, which has been shown by the agenda-setting research (Lee, 2006; Waal and Schönbach, 2008). Google News lacks a human component in its news selection and arrangement process (Google, 2016). A newsbot automates the process of news selection, providing internet users with access to a virtually limitless number of stories from a diverse range of news outlets (Sundar et al., 2007). Google News stresses access and diversity, which creates a normative divide, with traditional media seeking to create a purposively ordered set of news stories in a hierarchically arranged news product that makes sense of each item through its relationship with other items (Carlson, 2007). There is a lack of studies investigating news selection, especially on the news aggregator website Google News (Segev, 2010; Sundar et al., 2007),

and therefore little is known about the reasons why users may or may not select a news article on Google News, or if there are differences depending on the cognitive elaboration.

The presentation, position, recency, and source of a news result have been shown to play a role in users' selection of search results on search engine (Granka, Feusner, and Lorigo, 2008; Lorigo et al., 2008) and news aggregator websites (Sundar et al., 2007). As peripheral cues, they can help guide selection, and may aid users in coping with the overload of news (Sundar, 2008; Sundar, Jia, Waddell, and Huang, 2015; Xu, 2013). The impact of news cues should be even more important on a news aggregator website, where a limitless array of information is presented. News cues can offer one important aspect of orientation and focus attention on possible relevant news (Sundar et al., 2007).

News factors have been shown to influence users' selection of news on TV and in newspapers (Donsbach, 1991; Eilders, 2006; Shoemaker and Cohen, 2006). There is also evidence supporting the importance of news factors for online news sources. This has been shown, for example, in selective participation and interactivity through user comments (Weber, 2014; Ziegele, Breiner, and Qiring, 2014), on Twitter (Papacharissi and de Fatima Oliveira, 2012), on social networking sites (Hautzer, Lünich, and Rössler, 2012), and in the selection of news on websites (Seibold, 2002; Wendelin, Engelmann, and Neubarth, 2017). News factors can be understood as general relevance indicators guiding the attention of humans (Eilders, 2006; Schmid-Petri, Häussler, and Adam, 2016; Shoemaker and Cohen, 2006). In traditional media, news factors are conveyed in terms of size and position. On Google News the scope barely matters, just the position. The Google News ranking of news employs a temporally rigorous application of a set of institutionalized news factors that dictates relative newsworthiness; there is no human journalist/gatekeeper who orders information and its news factors to create a finite news product (Carlson, 2007). The question is still open as to whether news factors still play a role in the news selection in times in which there is an overwhelming number of news services on the internet compared to traditional news offers, and in particular, as to what role they play on news aggregator websites.

The aim of the present explorative study is to investigate users' reasons for news selection, and more specifically, to analyze the role news factors play for users in selection on the Google News website. The sections that follow contain an introduction to online news selection (considering users' cognitive elaboration), highlight the role of news cues as peripheral relevance indicators, and focus on the theory of news selection and the role of news factors. The multi-method approach used to answer the research questions derived from the theory is then introduced, along with the results of the study.

## 2 Online news selection

Bates (2002) differentiates between a directed and an undirected mode of information seeking. Directed (active) searching attempts to answer specific questions or develop an understanding around a particular topic area (this makes up only 1% of online activity). The undirected viewing mode of web users pertains, in relation to information needs, to more general areas of interest; the users want to be kept up-to-date by scanning news broadly. It can be assumed that this information-seeking mode is prevalent on Google News when users search actively and in an undirected way for general information.

Selection is an action in which an individual selects a stimulus she/he wants to receive and process from a virtually infinite range of stimuli (Donsbach, 1991). Selectivity is a three-dimensional psychological concept that encompasses selective attention, selective perception, and selective retention (Donsbach, 2004). Selective attention determines which content will be perceived. In the process of selective perception, users decide how to process and store the perceived information. This study focuses on the third dimension: the process of selective retention, in which cognitively perceived and processed information is once again selected for recollection. The perceived information, which is the reason for a selection, is potentially conscious and can be accessed again. Web users are neither strictly rational nor purely heuristic (Tremel, 2010). Many cognitive processes can be arranged on a continuum from (intuitive) automatic-unconscious/peripheral to (reflective) controlled-conscious/systematic (Phillip et al., 2016). The information processing modes can be understood as prototypical poles of an elaboration continuum. These poles may vary in their extent, for example, as considered in the dual processing models such as the Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986) or the Heuristic Systematic Model (HSM) (Eagly and Chaiken, 1993). The meta-analyses by Phillips, Fletcher, Marks, and Hine (2016) found reliable associations between information processing modes and decision-making performance: Reflective thinkers are better at analytic decisions, and intuitive thinkers are better at time-pressured decisions. How much elaboration, with respect to which information processing mode people use, is especially influenced by the need for cognition and the need for cognitive closure of recipients (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986; Phillips et al., 2016)?

The systematic processing mode is a comprehensive, deep-analytical analysis of the content of a message, for example, the quality of presented arguments (Petty and Cacioppo, 1986). In comparison, the heuristic/peripheral processing mode requires significantly less cognitive capacity; instead of focusing on content, people focus on specific and situational information, known as periph-

eral cues or indicators (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986). These peripheral indicators can include the so-called ‘news cues’ in a news feed, that is, visual suggestions of information salience, which may have an impact on selective perception and exposure (Sundar, 2008; Sundar et al., 2015; Xu, 2013). News cues help users make quick judgments by applying heuristics based on past experience (Sundar, 2008). For example, presentation, position, recency and source cues may serve as necessary peripheral indicators for credibility or other perceptual and behavioral outcomes, such as news attention or clicking on a news item (Sundar et al., 2015; see also Seibold, 2002). However, according to the two-process theories, peripheral cues can also act as central arguments, and content-related arguments as peripheral cues (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986).

Google News articles are selected and ranked automatically using algorithms that evaluate how often and on what sites a story appears online, and evaluate characteristics of news content such as recency, location, relevance and diversity (Google, 2016). The Google News front page provides roughly the first 200 characters of the article and a link to the full contents. News leads are typically accompanied by different cues, for example, the name of the primary source from which the headline and lead were borrowed and the time that has elapsed since the story broke (Sundar et al., 2007). The news cues help users cope with the overload of information on news aggregator websites. Sundar et al. (2007) conducted a within-subjects online experiment regarding Google News, in which the source, the upload recency, and the number of related articles were systematically varied to investigate their effects upon perceived message credibility, newsworthiness, and likelihood of clicking on the news result. They found evidence for the importance of these cues, especially of the source. Research about the selection processes on search engine websites shows that the order and presentation of search results are very likely to influence the way internet users select and navigate through a website (Granka et al., 2008; Kessler and Zillich, 2018; Seibold, 2002). There is also a predominance of click-throughs on the number-one listing, and users mainly consider listings only down to the third or fourth search result (Granka et al., 2008; Kessler and Zillich, 2018; Lorigo et al., 2008). Even in social media environments, mainly in the area of information retrieval and human-computer interaction, the position and content characteristics, as well as social signals, play an important role in online decision-making processes (e.g., Hogg and Lerman, 2015; Lerman and Hogg, 2014). Previous research from different disciplines has shown that users turn their initial attention to online news on visual elements (Bucher and Schumacher, 2006; Sundar et al., 2015). The perceived relevance indicators, the news cues such as the position or source, and content variables can be important for news selection (Seibold, 2002).

### 3 News factors and news selection

News factors are characteristics of events that may become news, for example, the damage occurring from a terror act (Kepplinger and Ehmig, 2006), and influence the audience's news selection (e.g., Eilders, 2006; Galtung and Ruge, 1965; Shoemaker and Cohen, 2006). The relative impact of news factors on the selection of news is defined as news value. "News values are—other than news factors—not qualities of news stories, but characteristics of journalists—their judgments about the relevance of news factors" (Kepplinger and Ehmig, 2006, p. 27). News values can help to determine the impact of a news item for a given audience. In a seminal study on this topic, Galtung and Ruge (1965) showed that there are quantitative factors that are consistently applied by journalists for news prioritization across different cultures and organizations. The results from the study of Schmid-Petri, Häussler, and Adam (2016) show that news factors are also applied by non-journalist actors like laypeople, bloggers, or semi-professional civil society actors (see also Hautzer et al., 2012). The theory of news selection (Galtung and Ruge, 1965) provides a comprehensive set of twelve news characteristics, based on the principles of the psychology of perception.

Eilders (2006) strengthens the user perspective in the theory of news selection and interprets news factors as general relevance indicators in human perception. She justifies the value of the news factors for selection by using biological evolutionary theory and cognitive and social-based psychological processes (see also Shoemaker and Cohen, 2006: biological instincts and cultural learning processes). According to Eilders' (2006) conceptualization, news factors influence both the allocation of cognitive resources (i.e., focal attention) and the activation of existing knowledge during the reception of news items. The news user thereby generates general relevance assignments for three reasons, according to Weber (2014) (in reference to Eilders, 2006). First, the automatic assignment of relevance to news items that are associated with damage or conflict, are unexpected, and have factual consequences, is a result of biological evolution. News factors like unexpectedness, prominence, emotions, personalization, or controversy are news factors of the so-called deviance dimension (see also Wendelin et al., 2017). Second, based on the social identity of the user, relevance is assigned to news items that are related to their own national or social group, news in which powerful persons or institutions are involved, or that have positive or negative consequences on a societal level. News factors like impact, reach, elite location, facticity, success, and damage are news factors of the social significance dimension (see also Wendelin et al., 2017). Finally, for news items that are associated with issues that have already been established in preceding news coverage, the assignment of relevance is much more likely. Of course, these explanations are not independ-

ent from each other; all of them suggest that news factors can increase a user's interest (Shoemaker and Cohen, 2006; Ziegele et al., 2014). Hautzer, Lünich, and Rössler (2012) demonstrated that on the internet, time-referenced news factors, such as recency and continuity, are predominant.

The theory of news selection originally assumed that recipients consider all news factors in a message to be equal. The additivity hypothesis of Galtung and Ruge (1965) claims that the higher the total score of an event, the higher the probability that it will become news, and even make headlines. Hautzer et al. (2012) confirmed this hypothesis for users' news selection on social networking sites. However, the additivity hypothesis is based on high cognitive effort, which cannot often be confirmed empirically and may therefore need even more cognitive elaboration during the online browsing process. With regard to the role of news factors in the selection of print articles by recipients, it has been shown that only a few news factors have proven to be influential after statistical control (Eilders, 2006; see also Shoemaker and Cohen, 2006). This can also be observed for the selection processes of online users (Hautzer et al., 2012; Seibold, 2002; Weber, 2014; Wendelin et al., 2017; Ziegele et al., 2014). For example, Weber (2014) found that for political news, the news factors of geographical proximity, reach, and continuity have a positive effect on the level of participation and the degree of interactivity, and that the factors of impact, controversy, and damage are related solely to interactivity. In addition, Ziegele et al. (2014) found that the news factor of controversy in comments could explain interactivity in news discussions. However, they also found additional important factors in comments on a news story, like unexpectedness and personalization. Wendelin et al. (2017) show that high-ranked news in user rankings concerning news reception (most read) and news multiplication (sent by e-mail and through social media activity) contained fewer news factors than high-ranked news written by journalists. Furthermore, in journalistic media outlets, news factors of social significance as culturally mediated factors were slightly more important than they were for internet users. Seibold (2002) found that news factors of deviance as biologically justified factors were more important for the selection of news in 2001. Studies looking at news selection from 2007 found that for the online audience, news factors of social significance were more influential than news factors of deviance (Hautzer et al., 2012; Lee, 2009; Ziegele et al., 2014). One explanation for this difference could be that the internet had become more important as a social web, which may have also influenced news selection (Hautzer et al., 2012).



## 4 Research questions and hypotheses

The overarching research question (RQ) explored in this study is:

*RQ1: What are users' reasons for selecting specific news items on the Google News website?*

As collective relevance indicators, news factors lead people to assign relevance concurrently and involve users beyond their individual interests (Eilders, 2006; Shoemaker and Cohen, 2006; Weber, 2014). Therefore, they should encourage the users' news selection.

*H1: News factors are a relevant reason for the selection of news on the Google News website.*

As shown in the previous section, different current studies found that for online users, news factors of social significance as culturally mediated factors are more influential and more important in user rankings of the most commented-on stories than news factors of deviance (Hautzer et al., 2012; Lee, 2009; Ziegele et al., 2014). Therefore, it can be assumed:

*H2: News factors of social significance are more important as selection reasons for internet users than news factors of deviance on the Google News website.*

As mentioned, Hautzer, Lünich, and Rössler (2012) demonstrated that on the internet, time-referenced news factors, such as recency and continuity, predominate. Therefore, it can be assumed:

*H3: Time-referenced news factors are more important than other news factors as selection reasons for internet users on the Google News website.*

The information-processing modes are to be understood as prototypical poles of an elaboration continuum. Depending on the elaboration, people are aware of different relevance indicators for information selection (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986; Phillips et al., 2016). Therefore, different reasons could be relevant for the selection of a news result. This led to the formulation of a second research question.

*RQ2: How do the selection reasons of the internet users on the Google News website differ depending on their cognitive elaboration during the online browsing process?*

## 5 Methods

Three different methods are used to investigate the RQs: an open survey, a closed survey and a content analysis of screen-recording data. Initial internet-based studies that investigated news selection often used only surveys or log-file analyses to obtain data (e.g., Kim, 2009; Sundar et al., 2007). The screen recording in combination with a content analysis and a survey can help researchers better understand how individuals select and read the information presented to them online.

Self-reports about news selection can be profoundly influenced by the research instrument. At all steps of the response process—from question comprehension to recall, inference and estimation, response formatting and the eventually recorded answer—the information provided by the respondents depends in crucial ways on the specifics of the questionnaire (Schwarz and Oyserman, 2001). Unfortunately, reporting on one's behavior poses a difficult cognitive task, and participants' reports can be influenced by question wording, format and context (Schwarz and Oyserman, 2001). Open-ended questions require people to answer in their own words, making it difficult to transform the answers into a format that can be treated quantitatively (Tourangeau and Bradburn, 2010). Furthermore, respondents do not always give the answer that fits best, since, for example, they tend to report doing things that they have not done, but feel that they should have, a process known as social desirability bias (Tourangeau and Bradburn, 2010). Closed-ended questions require people to choose from a set of provided response alternatives. A closed-ended format is often preferable as long as the researcher can ensure that the item list is reasonably complete (Alwin, 2010). Although this reduces the risk that an important item is unreported, it also increases the risk that participants will over-report an item (Schwarz and Oyserman, 2001). However, the respondents' use of a rating scale depends on the objects that the respondents are asked to rate, with the extreme object serving to define the ends of the scale. Thinking about other objects is likely to affect both their judgment and how they map it onto the rating scale (Tourangeau and Bradburn, 2010). Furthermore, the use of rating scales can also be affected by the bias of the tendency to give out mostly favorable ratings and the tendency to avoid extreme ratings (Tourangeau and Bradburn, 2010). The bias of social desirability can be of concern to both the open and the closed survey (Alwin, 2010; Tourangeau and Bradburn, 2010). Overall, recent research has shown that there are distinct advantages for both closed-ended and open-ended questions. Therefore, questions about the news factors which were important for users' news selection were asked first with open-ended and then with closed-ended questions. In order to control the

bias, a content analysis of the selected news results was also carried out in this study.

## 5.1 Design, participants, and procedure

For this investigation, 47 students ( $M_{\text{age}} = 23.3$ ;  $SD_{\text{age}} = 2.1$ ; 72% female) were recruited in a German university town in 2015. Participants set up individual appointments to participate in this study at the media laboratory, where a computer was equipped with a remote eye tracker (from SensoMotoric Instruments (SMI) iView X Red, 120Hz). The eye-tracker was used in this study for the screen recording.

When the participants arrived at the media laboratory, the correct focus of each participant's eyes was calibrated (nine-point) and its validity was confirmed with the help of the eye-tracking software from SMI; these values were found to be within an acceptable range for all participants. The specific task is a fundamental factor concerning information seeking on the internet (Bates, 2002; Kim, 2009). The present study focused on both an active, undirected and open-ended task, but also on a focused and goal-oriented task in getting an overview of current events. The given task of this study was a free search: *“Please get an overview of current events. The Google News website will be set as the start page.”*

Participants were given time until they had selected a maximum of five news results during the online browsing process, primarily for economic reasons, although the researchers did not tell them this. However, most participants clicked on only one news result on the Google News website. The news selection was operationalized as the clicking on a news result with the computer mouse. Due to the research focus, Google News was set as the homepage for the internet browser.

The eye tracker recorded participants' online browsing process. Furthermore, a content analysis of the screen recording was conducted. To conduct a content analysis of participants' online behavior, a detailed and systematic codebook was created to indicate the news factors in the depicted news results. The coded news factors were theoretically justified by Eilders (2006). Regarding the 14 news factor variables, this investigation mainly followed their operationalization (see Table 1). The news factors were measured as dichotomous variables (news factor existing/not existing).

In total, three trained coders helped to conduct the content analysis of screen recording data. Fifty-one news results of participants' news selection (42% of the total sample of the selected news results) were randomly selected for reliability testing. Holsti's reliability coefficient and Krippendorff's Alpha were used to

measure inter-coder reliability to ensure results (see Table 2), and overall there are satisfying reliability values.<sup>1</sup>

After the eye-tracking session, the participants were required to complete a paper-and-pencil survey. The users were asked open questions about the conscious reasons for their choices regarding each news result. After that, a standardized questionnaire was used to ask participants about the importance of the different news factors and position for each selected news result, and whether they remembered the source of the selected news result. As a reminder, participants were shown a screenshot of each selected news result generated with the eye tracker, on which only the parts of the screen that were visible were those which had previously been fixated on with the eyes. For each selection of a news result, participants had to evaluate the importance of: the news factors, the position, the presence of a picture, the personal relevance on a five-point scale and the credibility of the specific news source (five items from Roberts, 2010; Cronbachs  $\alpha = .78$ ). Furthermore, the participants were asked, with regard to their cognitive elaboration (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986; Phillips et al., 2016), to answer RQ2 and H2, about their Need for Cognition (NfC) (16 items from Bless, Fellhauer, Bohner, and Schwarz, 1991 based on Petty and Cacioppo, 1986; Cronbachs  $\alpha = .89$ ) and Need for Cognitive Closure (NfCC) (10 items from Schlink and Walther, 2007; Cronbachs  $\alpha = .86$ ).

In a last step, the participants' open answers were analyzed via content analyses to detect the news values, which were important for the selection of a news result. A detailed and systematic codebook was created to indicate the selection reasons and the news values (see Table 1). The coded news values were theoretically justified analogous to the first content analysis. In total, five trained coders helped conduct the content analysis. Seventeen participants' open answers about the news result selection (19% of the total sample) were randomly selected for reliability testing. Holsti's reliability coefficient was used to measure inter-coder reliability to ensure results and show satisfying values (see Table 3).

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<sup>1</sup> Reasons for low Krippendorff's Alpha are either the lack of variance of these news factors (in the case of unexpectedness and success) or difficult identification due to a very small amount of text (in the case of impact and damage). Generally, the reliability coefficients of news factors are comparable to other studies (e.g., Weber, 2014, Wendelin et al., 2017).

## 6 Results

The 47 participants selected 90 news results ( $M = 1.9$ ). These news results were analyzed via content analysis and, after selection, the participants were asked about the reasons for their choice in both an open and a closed survey. In total, reasons for the selection were openly named for 90 selected news results.<sup>2</sup> The reasons for the choices (RQ1) were queried using an open-ended question, and the importance of each of the selections of a news result was queried using a closed question on a scale from 1 (*not at all important*) to 5 (*very important*).

Personal relevance, the presence of a picture, the position of a news result, and the source could be identified as selection reasons. That the news result involved a subject by which one was affected was reported most often in the open question (30 times) but was assessed in the closed question as rather unimportant ( $M = 2.56$ ;  $SD = 1.43$ ). That the representation, for instance, the use of a picture, played a role was reported in the open question only once and was evaluated as rather unimportant in the closed question ( $M = 2.10$ ;  $SD = 1.24$ ). However, the content analysis shows that the most-selected news results had a picture ( $n = 85$ ; 94%). That the position of a news result plays a role was reported in the open question five times, and in the closed question was found to be middling to fairly important ( $M = 3.38$ ;  $SD = 1.34$  classified by 70% as medium to very important). The content analysis shows that nearly two-thirds of the selected news results were listed in a higher position on the Google News page (first headline position;  $n = 55$ ; 62%). That the source of a news result plays a role was not reported in the open question but was found to be rather unimportant in the closed question ( $M = 2.55$ ;  $SD = 0.64$  classified by only 17% as medium to very important). The content analysis shows that two thirds of the selected news results were high quality media offerings ( $n = 62$ ; 69%).

Furthermore, different news values could be identified as selection reasons (see Table 4). The news factors of recency, impact, and reach were found to be relevant in the open and closed survey and according to the content analysis. The recency of a news result, the fact that it affects many people and that it contains a person or group with influence, were very frequently reported openly, and were considered in the closed question to be rather important. Accordingly, the content analysis shows that the most-selected news results are very current and not older than an hour, and that they are about a person or group with great influ-

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<sup>2</sup> The 35 participants (75%) who had never previously visited the Google News website do not significantly differ in the mean of selected news results from the participants who had previously visited the Google News website.

ence and about a topic that affects many people. Continuity was not measured via the content analysis, but that the news result is about an established topic was reported in the open question seven times and was considered in the closed question to be rather important.

Not very relevant in the open and closed surveys, but found to be relevant according to the content analysis, were the news factors of personalization and damage: That a news result is about a specific person was reported only twice in the open question and was also assessed to be rather unimportant in the closed question. However, the content analysis shows that almost half of the selected news results were about a specific person. That the news result contains damage was not reported in the open question, and was evaluated in the closed question as important only to a middling degree. However, the content analysis also shows that nearly two-thirds of the selected news results were about some type of damage.

Inconsistently relevant in the open and closed survey and the content analysis were the news factors of facticity, prominence, and controversy. That a news result contains a concrete action was not reported in the open question, but was assessed as the most important value in the closed question, and the content analysis shows that more than half of the selected news results were about a concrete action. That the news result contains a prominent person was also reported in the open question only twice and was considered middling to rather important in the closed question. The content analysis shows that more than one third of the selected news results were about a prominent person. The fact that the news result contains a dispute was reported in the open question relatively often, but was considered to be important only to a middling degree in the closed question. The content analysis shows that half of the selected news results were about a controversy.

Considered not very relevant in the open and closed survey, and found to be not relevant according to the content analysis, were the news factors of success, emotion, unexpectedness, and elite locations. Table 4 shows the ordered news factors detected in the content analysis of the selected news results, and news values of the open and closed survey. Calculated rank correlations between the three orders show that no significant correlation exists between the order of the news factors detected in the content analysis of the selected news results and the order of the news values of the open survey (Spearman's  $\rho = .40$ ; n. s.), or between the order of the news values of the open and the closed surveys (Spearman's  $\rho = .27$ ; n. s.). However, significant correlation was found between the order of the news factors detected in the content analysis of the selected news results and the order of the news values of the closed survey (Spearman's  $\rho = .70$ ;  $p < .01$ ).<sup>3</sup> The

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<sup>3</sup> News factors/values that are not in both orders were removed from the calculation.

large standard deviation regarding the importance of the news factors is striking for the closed survey. Often, the extreme points were chosen here (1 *not at all important* or 5 *very important*). This indicates that specific news values were very important for some participants, while they were unimportant to others. Most of the news factors were less pronounced in the justifications for selection in the open survey than found by the content analysis. This finding applies especially to the news factors of damage and factuality. With respect to H1, news factors can in fact be said to be a relevant reason for the selection of news on the Google News website.

The content analysis of the selected news results shows that, on average, news results tend to contain more news factors of social significance ( $M = 0.56$ ;  $SD = 0.16$ ) than news factors of deviance ( $M = 0.38$ ;  $SD = 0.23$ ). The paired student t-test shows that the mean values differ significantly from one another ( $\Delta M = 0.18$ ;  $SD = 0.27$ ;  $t(87) = 6.25$ ;  $p < .001$ ). This provides some support for H2: *News factors of social significance were more important as selection reasons for the internet users than the news factors of deviance on the Google News website*. However, the news factors of deviance ( $n = 18$ ) were mentioned openly as a reason as often as the news factors of social significance ( $n = 17$ ). The closed survey shows that the news factors of social significance were classified as slightly more important reasons for selection ( $M = 3.06$ ;  $SD = 0.70$ ) than the news factors of deviance ( $M = 2.83$ ;  $SD = 0.70$ ). The paired student t-test shows that the mean values differ significantly from one another ( $\Delta M = 0.29$ ;  $SD = 0.70$ ;  $t(52) = 3.00$ ;  $p < 0.05$ ).

As shown in Table 4, H3 is also supported: The time-referenced news factors predominantly influence selection reasons for internet users on the Google News website. In particular, the news factor of recency is the most frequently cited news factor in the content analysis of the selected news results, and is regarded as highly important in the closed survey, analogous to the news factor of continuity.

Cognitive elaboration will be the focus for answering RQ2. The NfC of the participants is on average on a middle level ( $M = 2.5$ ;  $SD = 0.53$ ; 1 = lowest NfC to 6 = highest NfC), and the NfCC is a bit higher ( $M = 3.2$ ;  $SD = 0.76$ ; 1 = lowest NfCC to 5 = highest NfCC). An accurate memory of the source can be considered a further indicator of high elaboration. The more thorough the elaboration, the better the memory (Eagly and Chaiken, 1993; Petty and Cacioppo, 1986; Phillips et al., 2016). The recollection of the source as a substantive factor does not correlate with the peripheral indicator of the source. For 51 selected news results (57%), participants could not remember the source. For 28 selected news results (31%), participants correctly remembered the source of a selected news result. The presence of a picture, the position of a news result, and the source cue could be identified as selection reasons without significant differences regarding the NfC, NfCC,

or source memory of the participants (analyzed by the estimation of regression models for each news cue). As a further dependent variable, an additive index was formed from the identified (dichotomous) news factors of the selected news results ( $M = 5.74$ ;  $SD = 1.72$ ; 0 = no news factor to 10 = ten news factors). The estimation of regression models found that neither the NfC nor the NfCC explain the variance of the news value index. However, the correct memory of the news source was a significant predictor of the news value index ( $R^2 = 0.05$ ;  $F(1, 85) = 4.38$ ;  $p < 0.05$ ;  $\beta = 0.22$ ;  $t(85) = 2.09$ ;  $p < 0.05$ ). If the participants could remember the news source correctly, they selected news results with more news factors.

## 7 Discussion

The aim of the present study was to gain a deeper understanding about the reasons for users to select a specific news article from the news aggregator website Google News. This investigation was also concerned with the role of news factors in this selection process during online browsing. Different relevance indicators of news results on the Google News website are important for news selection. News factors and news cues like the position of a news result, source, and the presence of a picture could be identified as selection reasons that play an important role in users' selection of news on the Google News website. As indicated by the content analyses of the screen-recording data, the open-ended survey, and the closed survey, news factors seem to be important to a varying degree in the selection process.

News cues (presence of a picture, position of a news result, source) are identified as selection reasons without differences regarding cognitive elaboration during the online browsing process. The additivity hypothesis of Galtung and Ruge (1965) was supported, albeit weakly, in this study. Those users who elaborate more select news results with more news factors than users who elaborate less. Hautzer et al. (2012) also found evidence supporting the hypothesis for the users' selection on social networking sites, although the different news factors were of varying degrees of importance for the selection. The importance of the news cues of picture presence and position probably arises because position and visualization in traditional print media and news websites already play an important role, and users have more strongly habitualized their orientation to these cues (Bucher and Schumacher, 2006; Lerman and Hogg, 2014; Sundar et al., 2015). Overall, the results of this study also indicate that users are unlikely to distinguish between traditional websites and Google News in their selection decisions. News cues and news factors play a similar role accordingly, although news



on Google News offers a different way to access news (e.g., Carlson, 2007; Sundar et al., 2007). The users are probably not aware of the lack of a human component in the news selection and arrangement process, or they trust in the Google News algorithm. Normatively, this can be viewed critically in relation to the societal role of journalism (see Carlson, 2007). Further, the users are probably not overwhelmed by the fact that there is access to a virtually limitless number of stories from a diverse range of news outlets, and just use established heuristics and routines in their selection processes. The current study suggests that the news factors of social significance were more important as selection reasons for internet users than the news factors of deviance on the Google News website. These findings are in line with current studies of the online context (Hautzer et al., 2012; Lee, 2009; Ziegele et al., 2014) and can be interpreted as follows, according to Eilders (2006) and Weber (2014): The effects of impact and reach can be assumed to result from socialization—news events pertaining to one’s own social group are more likely to appeal to the social identity of a user, and are therefore inherently more involving. The positive effect of continuity can be interpreted by referring to the assumption about the role of knowledge: It is likely that readers have some knowledge about the topic from prior news, and have probably developed cognitive schemas, which can be easily reactivated. The time-referenced news factors, recency and continuity, were shown to be very important, as in the study from Hautzer, Lünich, and Rössler (2012). The positive effect of recency can be interpreted by referring to the assumption about the role of the information-seeking mode: The undirected viewing mode is mostly used because the resources are up-to-date (Bates, 2002). The use of news consumption itself has also changed with increasing internet usage as users tend to receive many small bits of news during the day (Newman et al., 2015).

In this study, three different methods were used to answer the research questions, and the results were compared to ensure the accuracy of the findings. As it turns out, depending on the method, some of the same, but also some different, news factors could be identified as important. Reliability of measurement is a necessary condition for valid measurement. The level of measurement error is also associated with different measurements such as different types of surveys (Alwin, 2010). The ranks between the orders of the news factors detected in the content analysis of the selected news results and the order of the news values of the closed survey are correlated. The correlation comes from the fact that users actually perceive what is offered by content or news factors in a search result. From this perception, however, only a few things are relevant for the actual selection, so there is no longer a correlation with the results from the open-ended survey. This indicates that only a few news values could be thought of during the open survey, and most likely only the most prominent ones were mentioned, which also

reflects the total number of recorded news values. As mentioned before, closed-ended surveys reduce the risk that an important item is unreported, and increase the risk that participants will over-report an item (Schwarz and Oyserman, 2001). The problem of the post-hoc rationalization in the users' surveys, with regard to their selection reasons, can be resolved by the content analysis of the selection process. The combination of methods allows a more comprehensive picture and is therefore advisable for future studies regarding internet use.

One major limitation of this study is that the participant sample of university students is not representative because their reading, processing, and applying skills would probably differ from those of other social groups. It can be assumed that the student sample is homogeneous and had comparable cognitive abilities regarding internet news selection. But their high level of education may influence the selection of news results (Prior, 2003). Furthermore, there was only a small sample size, due to the complex methodical design.

Another limitation is that the study involved a forced task, in which participants had to inform themselves online in a laboratory situation. However, there is high external validity of the data: The natural browsing behavior on the actual internet is recorded and there are no artificially generated websites, as in previous studies (e.g., Sundar et al., 2007). Because the users searched on the real internet (in real time), they received different iterations of the Google News website. Therefore, the news results and the existing news factors varied and could not be controlled.

News aggregator websites, and especially Google News, are a key gateway to news for internet users in many countries (Newman et al., 2015; Segev, 2010). In conclusion, it was found that news factors play an important role in news selection decisions, even on news aggregator websites where there is an information overload context.

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## Appendix

**Table 1:** Variables of the content analysis of the depicted news results and of the answers in the open survey.

Variables	Content analysis of the depicted news results	Content analysis of the answers in the open survey
Impact (occurrence of influential persons, groups, or institutions) <sup>5</sup>	X	X
Reach (events and developments affecting a large number of people) <sup>5</sup>	X	X
Elite locations (places of great political or economic importance) <sup>5</sup>	X	X
Facticity (people or institution acting in dynamic or concrete situations) <sup>5</sup>	X	X
Success (positive outcome of a dynamic situation and/or action) <sup>5</sup>	X	X
Damage (negative outcome of a dynamic situation and/or action) <sup>5</sup>	X	X
Controversy (dissent expressed) <sup>9</sup>	X	X
prominence (occurrence of a well-known person)		

Variables	Content analysis of the depicted news results	Content analysis of the answers in the open survey
Unexpectedness (unexpected new event or surprising development) <sup>o</sup>	X	X
Personalization (focus on single persons while reporting an event) <sup>o</sup>	X	X
Emotions (reporting about feelings associated with an event) <sup>o</sup>	X	X
Geographical proximity (physical closeness) <sup>o</sup>	X	X
Actuality (release date) <sup>o</sup>	X	X
Continuity (established topic) <sup>o</sup>		X
Position of the news results on the Google News website (first headline position, mean position or after the scroll line) <sup>N</sup>	X	X
Sources of the news results (quality of media offers) <sup>N</sup>	X	X
Existence of a picture <sup>N</sup>	X	X
Personal relevance		X

<sup>s</sup> news factors of social significance; <sup>o</sup> news factors of deviance; <sup>o</sup> not classified news factors in line with Wendelin et al. (2017); <sup>N</sup> news cues

**Table 2:** Inter-coder reliability of users' perceived content on Google News.

Variables for each news result	Holsti coefficient with order*	Krippendorff's alpha
Position	.91	.91
News factor local status	.90	.69
News factor geographical proximity	.78	.75
News factor controversy	.82	.65
News factor reach	.76	.70
News factor impact	.78	.52
News factor prominence	.94	.88
News factor personalization	.90	.81
News factor success	.78	.30
News factor unexpectedness	.88	.51
News factor damage	.69	.26
News factor emotion	.94	.88
News factor recency	.92	.97
News factor facticity	.80	.46
News factor picture	1	1

\*  $n = 51$  news results

**Table 3:** Inter-coder reliability of open-ended reported news values for news result selection.

Name of the variable	Holsti coefficient with order*
Number of the person	1
Number of the news result	1
Length of the answer	1
Answer given	1
News value visual (picture and position)	0.98
News value impact	0.86
News value prominence	0.95
News value personalization	0.93
News value recency	0.86
News value success	0.98
News value damage	1
News value issue establishment	0.92
News value geographical proximity	0.91
News value elite locations	0.94
News value emotion	1
News value reach	0.85
News value controversy	0.95
News value unexpectedness	0.98
News value personal relevance	0.92

\* $n = 17$  reported reasons for news selection

**Table 4:** Order of the news factors detected in the content analysis of the selected news results and news values of the open and closed survey.

	Content analysis (for each news factor: if it exists or if it exists in the highest characteristic in a selected news result, with the most common one listed first)	Open survey (for each news value: how often it was chosen, most commonly chosen first)	Closed survey (for each news value: assessment of importance, most important first)
1	actuality (max. one hour, $n = 67$ )	actuality ( $n = 27$ )	facticity ( $M = 4.04$ ; $SD = 0.95$ )
2	impact (big and biggest, $n = 63$ )	controversy ( $n = 10$ )	continuity ( $M = 3.60$ ; $SD = 1.42$ )
3	reach (big and biggest, $n = 59$ )	impact ( $n = 8$ )	actuality ( $M = 3.56$ ; $SD = 0.97$ )
4	damage (exist, $n = 58$ )	reach ( $n = 8$ )	reach ( $M = 3.50$ ; $SD = 1.40$ )
5	facticity (concrete action, $n = 54$ )	continuity ( $n = 7$ )	prominence ( $M = 3.48$ ; $SD = 1.37$ )

	<b>Content analysis</b> (for each news factor: if it exists or if it exists in the highest characteristic in a selected news result, with the most common one listed first)	<b>Open survey</b> (for each news value: how often it was chosen, most commonly chosen first)	<b>Closed survey</b> (for each news value: assessment of importance, most important first)
6	controversy (big and biggest, $n = 49$ )	geographical proximity ( $n = 5$ )	impact ( $M = 3.33$ ; $SD = 1.25$ )
7	personalization (exist, $n = 44$ )	emotion ( $n = 4$ )	controversy ( $M = 3.32$ ; $SD = 1.35$ )
8	geographical proximity (big and biggest, $n = 40$ )	prominence ( $n = 2$ )	unexpectedness ( $M = 3.01$ ; $SD = 1.14$ )
9	prominence (big and biggest, $n = 38$ )	personalization ( $n = 2$ )	damage ( $M = 2.82$ ; $SD = 1.17$ )
10	unexpectedness (exist, $n = 14$ )	success ( $n = 1$ )	elite locations ( $M = 2.71$ ; $SD = 1.41$ )
11	elite locations (exist, $n = 10$ )	unexpectedness ( $n = 0$ )	emotion ( $M = 2.32$ ; $SD = 1.27$ )
12	success (exist, $n = 9$ )	elite locations ( $n = 0$ )	personalization ( $M = 2.28$ ; $SD = 1.24$ )
13	emotion (exist, $n = 5$ )	damage ( $n = 0$ )	success ( $M = 2.26$ ; $SD = 1.17$ )
14		facticity ( $n = 0$ )	

Note.  $N = 90$  selected news results on news aggregator website Google News