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FULL PAPER

Journalistic quality in the eye of the beholder: An eye-tracking study on user comments and their effect on journalistic quality perception

Journalistische Qualität im Auge des Betrachters: Eine Eye-Tracking-Studie zu Nutzendenkommentaren und deren Auswirkung auf die Wahrnehmung journalistischer Qualität

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Abstract: User comments have emerged as a prominent feature accompanying news articles, which has changed how audiences interact with journalistic content. While offering options for reader engagement and community building, previous research has shown that these comments also significantly shape readers' perception of an article's journalistic quality. The study extends this research strand with survey data on audience perception and eye-tracking technology in an experiment. This design allows for (1) analyzing eye movement data to gauge the attention paid to user comments and (2) how the presence, tone, and content of these comments influence readers' perception of overall quality. The results show that high-quality articles are more likely to captivate readers' interest and maintain their attention throughout the reading process than low-quality ones. Moreover, positive reader comments affect the perception of specific journalistic quality dimensions (e.g., transparency and diversity), while negative comments garner more attention. The findings shed light on this complex interaction between user comments and journalistic quality perception, offering valuable insights for journalists, news organizations, and online platforms striving to optimize the reader's experience while upholding journalistic standards.

Keywords: Eye tracking, journalistic quality, quality perception, user comments

Zusammenfassung: Nutzendenkommentare haben sich zu einem wichtigen Bestandteil von Nachrichtenartikeln entwickelt und damit die Art und Weise verändert, wie das Publikum mit journalistischen Inhalten interagiert. Während sie Möglichkeiten zur Leserbindung und zum Aufbau von Communities bieten, haben frühere Untersuchungen gezeigt, dass diese Kommentare auch die Wahrnehmung der journalistischen Qualität eines Artikels maßgeblich beeinflussen. Die Studie erweitert diesen Forschungsansatz um Umfragedaten zur Wahrnehmung des Publikums, und mithilfe von Eye-Tracking in einem Experiment. Dieses Design ermöglicht es, (1) anhand der Augenbewegungsdaten zu analysieren, wie viel Aufmerksamkeit den Nutzendenkommentaren geschenkt wird, und (2) zu untersuchen, wie die Präsenz, der Ton und der Inhalt dieser Kommentare die Wahrnehmung der Gesamtqualität durch die Lesenden beeinflussen. Die Ergebnisse zeigen, dass hochwertige Artikel eher das Interesse der Lesenden wecken und ihre Aufmerksamkeit während des gesamten Lesevorgangs aufrechterhalten als Artikel von geringer Qualität. Darüber hinaus beeinflussen positive Nutzendenkommentare die Wahrnehmung bestimmter Qualitätsdimensionen (z. B.

Transparenz und Vielfalt), während negative Kommentare mehr Aufmerksamkeit auf sich ziehen. Die Ergebnisse beleuchten diese komplexe Wechselwirkung zwischen Nutzendenkommentaren und der Wahrnehmung journalistischer Qualität und bieten wertvolle Erkenntnisse für Journalistinnen und Journalisten, Nachrichtenorganisationen und Online-Plattformen, die anstreben das Leseerlebnis zu optimieren und gleichzeitig journalistische Standards aufrechtzuerhalten.

Schlagwörter: Eye-Tracking, journalistische Qualität, Qualitätswahrnehmung, Nutzendenkommentare

1. Introduction

The rapid expansion of online news and social media platforms like Facebook, Instagram, and TikTok has transformed how (online) audiences consume and engage with journalistic content. News articles are no longer limited to being discussed among journalists and editors; instead, they have become interactive spaces where readers can actively participate through making comments (Springer et al., 2015), reading other users' comments, and shaping the narrative on issues by expressing their opinions (Wendelin et al., 2017). In short, user comments are a prominent feature accompanying online news articles.

While user comments certainly offer an avenue for reader engagement and community building, previous research demonstrates that they also have a profound impact on readers' perception of journalistic quality (Kümpel & Unkel, 2020; Prochazka et al., 2018; Weber et al., 2019). Further, the perceived credibility of news articles – measured using similar criteria as for journalistic quality (e.g., accuracy and impartiality) (Appelman & Sundar, 2016) – can be reduced when juxtaposed with critical user comments (Naab et al., 2020; Waddell, 2018). Consequently, understanding how user comments influence readers' perception of journalistic quality becomes crucial in a digital news environment.

Therefore, this study aims to explore the relationship between user comments and readers' perception of journalistic quality, which can be investigated using survey data regarding the audience's perception of journalistic quality and readers' visual attention patterns as they engage with online news articles and the accompanying user comment section through eye-tracking technology.

The research objectives are twofold. First, to investigate the extent to which readers actually pay attention to user comments by analyzing eye movement data: Understanding the visual attention to user comments is crucial for discerning their potential impact on readers' overall perception of journalistic quality. Second, to examine the influence of user comments on readers' perception of journalistic quality; manipulating the tone of user comments, enables assessment of how comments affect readers' perception of overall journalistic quality.

By applying eye-tracking technology, the findings will contribute to understanding the complex interplay between user comments and readers' perception of journalistic quality, which provides valuable insights for journalists, news organizations, and online platforms seeking to optimize the reader experience while maintaining high journalistic standards.

2. Literature Review

2.1 Journalistic quality from an audience perspective

The concept of journalistic quality has been a long-standing issue among scholars, with German researchers in particular having participated in the debate of defining the concept (Urban & Schweiger, 2014, p. 823). The complexity of developing a universally accepted and comprehensive definition arises from the need to consider various perspectives, including those of different groups (e.g., the audience, media practitioners, and legal experts), as well as the selection of appropriate reference points (e.g., target groups, functions of journalism, and sources) when trying to define journalistic quality. Urban and Schweiger (2014, p. 822) conclude that there "is no quality in an item itself, but only some kind of convention to interpret certain objective indicators as high or low quality."

The consensus of the heterogeneous discourse in journalism practice and academia is that journalistic quality is a multidimensional construct that relates to the normative functions of journalism in democratic societies (see e.g., Strömbäck, 2005). At the same time, Bucher (2003, p. 12) proposes a constructivist perspective, asserting that qualities are subjective constructs that can vary from individual to individual. This viewpoint highlights the inherent subjectivity in perceiving journalistic quality, emphasizing the influence of personal perceptions and biases. Given the impracticality of developing individual quality standards, the emphasis has shifted toward categorizing journalism types and media genres. This approach serves as a compromise between an overly narrow and a generalized perspective (Engesser, 2013, p. 459). This categorization process has led to operationalizing and measuring journalistic quality through a catalog of normative quality criteria (Urban & Schweiger, 2014). Against this background, another fundamental question emerges regarding whether the audience can recognize or evaluate the journalistic quality and to what extent (see among others, Jungnickel, 2011; Urban & Schweiger, 2014).

The digital age has introduced further challenges in understanding journalistic quality. Research now has to consider a more comprehensive array of media genres, fragmented audiences, and diversification within journalism than ever before. While normative discussions about quality remain relevant, the audience perspective has gained significant prominence (Jandura & Friedrich, 2014; Strömbäck, 2005) and led to a downright "audience turn" (Costera Meijer, 2020) in journalism. The criteria that fundamentally shape the perception of journalistic quality from the audience perspective are contingent on a range of factors, including individual characteristics such as education, media consumption habits, subject knowledge, and the medium itself (Geiß, 2020; Jungnickel, 2011). These varying factors further underscore the nuanced nature of audience perceptions.

In line with the analog letter to the editor, digital journalism users can express their perception of journalistic content through comments (e.g., Fletcher & Park, 2017, pp. 1285–1286; McCluskey & Hmielowski, 2011). The perceived quality by users is not only an expression of one's own opinion but also influences the

evaluations of journalistic content made by others (Kümpel & Springer, 2016; Kümpel & Unkel, 2020; Prochazka et al., 2018).

2.2 Influence of user comments on perceived journalistic quality

Online comment sections revolutionized the audience's participatory discourse by limiting the hurdles to interacting with the media organization and other audience members. In this context, user comments are a "subcategory of media-stimulated interpersonal communication that is published directly below news items on news websites or on news media presences within other online communication services" (Ziegele et al., 2014, pp. 1112–1113). Given that many news organizations have had comment sections for as long as they have been online, it is not surprising that they remain the most common participation feature on news organizations' websites in Germany (Niemann et al., 2021) and that they are regularly used by readers. Ziegele et al. (2017, p. 324) state that about one quarter of German online users write comments at least once a month on the websites of established news media, and Reimer et al. (2023, p. 1332) even conclude that between a quarter and half of users have commented on a news story at least once. In their study, Schultz et al. (2017, p. 251) found that 5 percent of respondents who rarely use the internet to keep up with current events comment very often or often on posts of legacy news media websites.

However, many news organizations have agonized over the value of the conversations that rage in the space below a story. There is an ongoing debate over the issue as newsrooms struggle with moderation and "dark participation patterns" of audience members using abusive language or hate speech (Frischlich et al., 2019, pp. 2015–2016). As a result, prominent daily newspapers in Germany like *Süddeutsche Zeitung* and *Frankfurter Allgemeine Zeitung* have closed or overhauled their comment sections – although it seems this is not an overwhelming trend – and tried to shift such discussions to social media platforms (Kim et al., 2018). Other possibilities to address the problems mentioned above are to close comment sections after a certain amount of time or not to allow comments on critical topics (e.g., terror attacks, rape, and war).

Previous research has shown that "[c]omments seem to influence both how individuals perceive the topics/issues covered in media content as well as how the content itself is evaluated" (Kümpel & Unkel, 2020, p. 89; for an overview, see Ksiazek & Springer, 2018). The effects of evaluative comments on readers could be explained using information-processing theories (Prochazka et al., 2018, p. 65). In the context of information overload, for example, in digital news environments, individuals are more likely to process the information in a peripheral way, relying on heuristic cues such as social information (e.g., comments, likes, and shares), which influence the perceived credibility of journalistic content (Naab et al., 2020) or the perception of the quality of news articles (Kümpel & Springer, 2016; Prochazka et al., 2018; Prochazka & Obermaier, 2022). At the same time, the psychological processes through which such effects occur remain undertheorized (Lee et al., 2021) and only a few scholars have investigated the relationship between user comments and perceived journalistic quality.

The findings from two online experiments by Dohle (2018) indicate that participants exposed to positive user comments tend to evaluate the journalistic coverage more favorably in terms of transparency, impartiality, and completeness compared to those exposed to negative comments.[1] Additionally, the study examined the evaluation of a high-quality journalistic news clip compared to a low-quality version. It was observed that the high-quality version received, on the whole, better quality ratings than the low-quality one. The overall quality of the news report was more positively evaluated when accompanied by positive user comments instead of negative ones.

In their investigation into whether unreasonable comments diminish the perceived information quality of an article, Prochazka et al. (2018) find that the presence of uncivil comments negatively impacts the perceived formal quality of an article. This effect, however, is observed primarily in the context of lesser-known news brands. Further, the mere existence of comments, irrespective of their tone or content, appears to lower the overall perceived quality of an article.

Research conducted by Kümpel and Springer (2016) demonstrates that user comments that specifically address the impartiality and accuracy of journalistic content consistently and significantly affect readers' perceived quality. When user comments lauded a news article for its impartiality and balance, it resulted in readers perceiving the article as being of higher quality in terms of impartiality. Additionally, although to a somewhat lesser extent, it also positively influenced perceptions of accuracy. A similar effect was observed for the perception of accuracy. When user comments emphasized that the article contained no errors or contradictions, readers perceived it as more accurate and, once again, as more impartial. Consequently, affirmations regarding the content within user comments generally lead readers to regard a news article as being of higher quality, irrespective of whether those comments explicitly address the article's impartiality or accuracy.

2.3 Eye movements and attention patterns

Tracking eye movements allows for concretizing the effect of media reception and visual stimuli, for which self-reporting methods cannot provide data or can only do so to a minimal extent (Geise, 2011, p. 160). As Bucher and Schumacher (2006, p. 352) state: "Eye movements are not the result of a simple automatic sensory mechanism, but are interrelated with a person's actions: They are actively used for exploring the environment as directed by a person's intentions."

To implement eye tracking into communication research, it is essential to consider the multidimensional construct of attention, as it is a precondition for further information-selection processes that inhibit or foster news selection behavior. According to Donsbach (2004, p. 147), the concept of news selection can be viewed as a multidimensional construct that includes attention, perception, and

1 Perception and evaluation of journalistic quality are considered two interdependent and sometimes synonymously applied concepts.

retention, all of which play a role in the selection process. Therefore, Sülflow et al. (2019, p. 174) conclude that:

> *Attention allocation can be seen as an indicator of more elaborate cognitive processing. Thus, if people fixate on content more intensively, it is more likely that they think about the content more thoroughly and process it more elaborately than content that is not or only shortly fixated upon.*

According to Smith et al. (2007; see also Engelmann et al., 2021, pp. 782–783), there is also a distinction to be made between selective attention and selective exposure. Selective attention refers to the specific aspect of a stimulus that captures attention. In contrast, selective exposure pertains to the outcome of the decision-making process in selecting what content to engage with.

Attention and selection processes are inherently subjective and not directly observable phenomena. These processes become discernible only through observing a series of consecutive actions, allowing us to ascertain what has been selected as the object of attention and the extent of attention allocation. Eye movements represent a significant indicator of these activities (Rayner, 1998, pp. 374–375).

These movements comprise at least three integral structural elements (Geise, 2011, pp. 167–171): (1) fixations as the concentrated focusing of the fovea onto a specific perceptual object where attention is likely to be allocated; (2) saccades, which play a crucial role in preparing the alignment of the eye for foveal focusing on the object and typically transition into a fixation, and (3) micromovements (especially microsaccades), which are mainly undirected and primarily serve the physiological control of fixation. Especially fixations and saccades of the eye on a given stimulus are important parts of visual attention, which itself is positively correlated with information processing, "as such attention makes content accessible for further processing in working memory" (Greussing et al., 2020, p. 809; see also Kruikemeier et al., 2018, p. 76).

3. Research question and hypotheses

As shown in the literature review, the influence of user comments on the audience's perception of journalistic quality has been the topic of various studies (e.g., Dohle, 2018; Kümpel & Springer, 2016; Prochazka et al., 2018). At the same time, as there is no direct access to people's subjective perception of such comments, eye tracking provides insights to validate users' self-reported cognitive processes to further explore the relationship between user comments and the audience's perception of journalistic quality. If attention allocation is an indicator of cognitive processing, visual attention affects the perception of user comments and the evaluation of journalistic quality. Therefore, the research question (RQ) is as follows:

> *RQ: To what extent do participants pay attention to a news article and its accompanying user comments?*

Readers focus on certain information, especially emotional information, which draws unconscious attention from the audience (Yiend, 2010). The extent to

which positive or negative information attracts attention is under debate. For example, findings by Kätsyri et al. (2016) on the effects of negative social media messages in media multitasking indicate longer viewing times than positive ones. A recent eye-tracking study by Kohout et al. (2023) indicates that visual attention is higher for negative than positive comments under heuristic processing conditions. Moreover, better recognition of story details was displayed when angry comments were present, compared to fearful ones. Therefore, it is hypothesized that:

> *H1: Readers are more likely to pay attention to negative comments than positive ones.*

Further, experimental studies have shown that media users can differentiate high-quality articles from low-quality ones (Jungnickel, 2011; Urban & Schweiger, 2014). It has also been observed that user comments can influence readers' perception of journalistic quality and specific quality dimensions. For instance, Dohle (2018) and Kümpel and Springer (2016) found that journalistic coverage accompanied by positive user comments tends to receive better evaluations than coverage with negative comments addressing specific quality aspects. Therefore, this leads to the second hypothesis:

> *H2: Positive reader comments positively influence the perception of journalistic quality dimensions.*

4. Method

4.1 Procedure, measures, and stimuli

Eye tracking is defined as "a process-tracking method that allows researchers to monitor the position (fixation, defined as the maintaining of the visual gaze on a single location) and movement of the eyes and thus to objectively assess news consumers' visual behavior" (Greussing et al., 2020, p. 811). Although it has been used as a method more frequently in the past decade (King et al., 2019, p. 156), it is (still) not a standard instrument in communication science. To improve the transparency of the research process, this study largely follows the guidelines for eye-tracking research by Fiedler et al. (2019).

In the present study, eye tracking was used to record the visual perception of user comments as a stimulus. Therefore, 13 areas of interest (AOIs) were defined for each article and its user comments to distinguish between visual attention directed at (1) different parts of the text and (2) the comments (available as a supplement). Within these AOIs, several commonly discussed visual attention research variables were analyzed (e.g., Geise, 2011; King et al., 2019).

A Tobii Pro Nano eye-tracking device was used to observe and analyze participants' gaze patterns on both the text and comments with a sampling rate of 60 Hz. The eye tracker was mounted on a 17-inch screen with a 1920 × 1080-pixel resolution. Sitting at a desk in front of the screen in a dedicated room for the experiment, participants could move their heads naturally without any equipment

restricting their movements. The distance between participants and the screen was continuously monitored throughout the session.

The participants were randomly assigned to a 2 x 2 between-comments experiment (see Table 1). The experiment itself took place over two academic terms to extend the overall sample: over 02.02.2021–17.02.2021 and 18.05.2021–02.06.2021. The whole procedure took about 20 minutes per participant, in addition to the survey (M = 11.45 min, SD = 12.17 min). No incentive or compensation was given. After the experiment, the participants received a debriefing (i.e., indicating the manipulation of the article and user comments).

A nine-point calibration procedure was employed to ensure accurate eye movement measurement. As there is no gold standard for data selection regarding eye tracking (Holmqvist et al., 2011, p. 141), the recommendation by Conklin et al. (2018, p. 24) was followed, setting the calibration deviations between 0.5 and 1 degrees. During calibration, participants were instructed to follow a dot displayed on the desktop screen, thus ensuring precise eye movement tracking. Participants were then provided with a brief explanation displayed on the screen and instructed to proceed by clicking "next" to access the news article with a total of five user comments, which contained either a positive or negative sentiment regarding the article, and which were written from scratch for the purpose of the experiment.

The news article used in this study was designed based on a real-world news story from the website of *Der Spiegel*, a highly trusted news magazine in Germany (Behre et al., 2025, p. 85) and one associated with good-quality journalism (Horz-Ishak & Thomass, 2021, p. 226).[2] Several modifications were made to ensure the distinctiveness of the stimulus, such as removing the news organization's name, changing the reporter's name, and changing the header's color while retaining the text's image and font. Moreover, the article was altered in accordance with the experiment by Dohle (2018), meaning that the text was altered with the help of students with a journalism background by introducing factual errors or giving incomplete information. In the high-quality version, the proposed quality criteria were effectively met. Conversely, certain aspects of the referenced article were incomplete in the low-quality rendition. This latter version's depictions of the issue were marred by incompleteness, inaccuracies, and elements that could be perceived as speculation.

To enhance participant recognition and familiarity, the news topic chosen for this study related to the potential implementation of a speed limit on Germany's Autobahn network. At the time of the experiment, leaked proposals by the federal government regarding speed restrictions had sparked significant public controversy. A government-appointed committee on the future of mobility was actively working on a proposal suggesting the introduction of a 130 kph (80 mph) limit to help Germany meet EU emissions targets. Although the issue of speed limits is frequently intertwined with climate change debates, German citizens and the country's influential automotive industry often criticize imposing a general speed limit. In this specific case, even Germany's transport minister, Andreas Scheuer of

2 The original article can be accessed here: https://www.spiegel.de/auto/deutscher-verkehrssicherheitsrat-fordert-tempo-130-auf-autobahnen

the Christian Social Union (CSU), vehemently opposed the idea, ultimately leading to the federal government rejecting the proposal.

Every news article in the experiment was supplemented with five user comments. In both versions, whether the comments were positive or negative, one comment offered a slightly contrasting viewpoint. The comments in both versions were nearly identical in length, with 30 words on average. The negative comments primarily focused on critiquing the article's transparency, completeness, and accuracy, maintaining a respectful tone without resorting to vulgar or aggressive language (e.g., "There are at least as many arguments against a speed limit as there are for it, but they are always left out. One-sided reporting!!!").[3] Conversely, the version dominated by positive comments featured users responding favorably to the information presented in the article or to the article itself (e.g., "Thank you for this article, which presents facts instead of lobbying. The figures help [you] form your own opinion."). The comments were based on existing user comments and underwent pretesting for sentiment by other students.

4.2 Additional measures

For evaluation of the perceived journalistic quality, the study relied on self-report data obtained via an online survey after reading the stimulus material, as "eye tracking alone provides no or only little potential for answering questions such as [...] what the recipients think or feel while observing the visual stimulus" (Geise, 2011, p. 151). A pretest of the questionnaire was carried out, which combined verbal probing techniques (e.g., comprehension and specific probes) and retrospective thinking aloud (Willis, 2018).

Therefore, participants were asked how they perceived the article's journalistic quality: Overall (i.e., "Overall, I consider the quality of the article to be good.") and using statements in accordance with seven items that represent different quality dimensions (Dohle, 2018; Urban & Schweiger, 2014). Both were measured with a five-point Likert-type scale (e.g., "Please rate the quality of the article based on the following statements: This article contains accurate information: 1 = strongly disagree to 5 = strongly agree").[4] The seven quality dimensions were defined as follows:

First and foremost, journalistic coverage should encompass a broad spectrum of social groups and ideas, allowing for the representation of diversity (i.e., "This article contains diverse information"). Second, news should center around current and socially significant topics, highlighting their key aspects to maintain relevance (i.e., "This article contains relevant information"). However, the value of this information lies in its accuracy, which is fundamental for citizens to comprehend societal issues and formulate informed opinions and decisions (i.e., "This article contains accurate information"). Equally critical is ensuring that the recipients readily understand this information, emphasizing comprehensibility (i.e., "This

3 Comments presented here are translated to English

4 Survey questions are translated into English here; the questionnaire and stimuli in German are available upon request.

article contains comprehensible information"). Further, for journalism to empower citizens to make competent and unbiased judgments, it must uphold the principles of impartiality, offering neutral and balanced reporting on all facts, claims, and positions (i.e., "This article contains impartial information") and provide transparency by divulging insights into the journalistic processes and story creation (i.e., "This article contains transparent information"). Ultimately, adherence to ethics is the ultimate dimension for quality news reporting (i.e., "This article reports are ethically responsible").

4.3 Participants

A total of 145 participants took part in this study, 76.6 percent of whom self-identified as male and 23.4 percent as female. The age range was between 19 and 41 years (M = 24 years; SD = 3.297); 60 percent of participants had at least a high school diploma,[5] and about 30 percent had a BA degree. A total of 65.2 percent were interested or very interested in comments on digital platforms (e.g., social media and online news websites). However, 84.1 percent stated they had not commented on journalistic articles in the previous six months.

The participants were recruited by students from two MA media and management studies courses in 2020 and 2021 at a German university, mainly among their peers, and randomly assigned to one of the four experimental conditions. Although an equal sample size of experimental groups is deemed optimal, the availability of participants is often influenced by circumstances beyond the researchers' control (Cohen, 1988, p. 207) and other obstacles such as the no-show behavior of individuals (Amberger & Schreyer, 2024), resulting in slightly unequal sample sizes (see Table 1).

Table 1. Frequency of experimental conditions

Article Design	Participants	Percentage
High article quality/negative comments	42	29.0
High article quality/positive comments	33	22.8
Low article quality/negative comments	34	23.4
Low article quality/positive comments	36	24.8
Total	145	100

It is worth noting that the choice of predominantly student participants in eye-tracking studies is commonly observed, as highlighted in a meta-analysis by King et al. (2019, p. 157). Moreover, the sample size for this study exceeds the average size typically observed in eye-tracking studies (King et al., 2019, p. 155).

5 Sekundarbereich II (Gymnasium, integrierte Gesamtschule, Fachoberschule, Berufsschule)

5. Findings

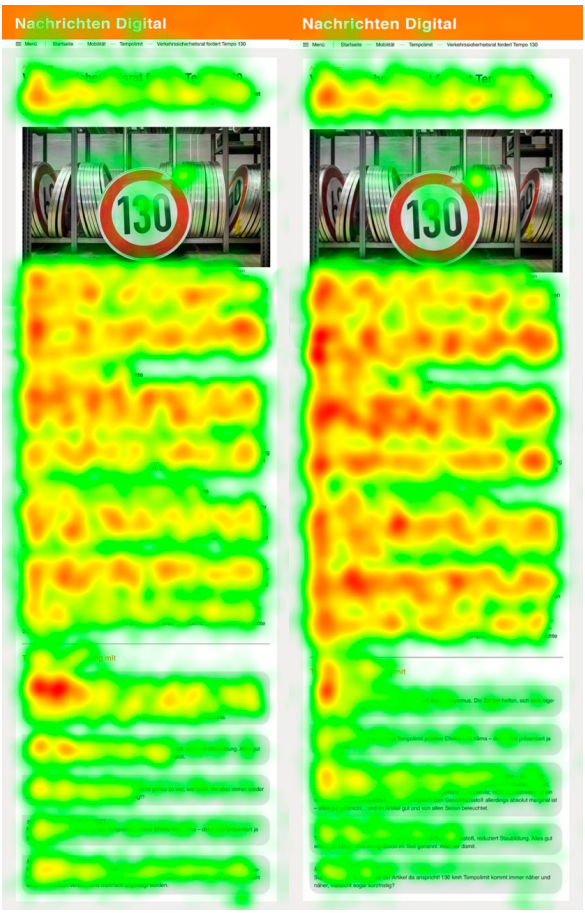
The RQ pertains to the participants' level of visual attention directed at the various segments of the news article and its accompanying user comments. This data was extracted from the aggregated gaze visualization, offering a visual representation of combined fixations from multiple viewers on defined AOIs.

Heat maps enable data visualization of the attention-capturing sections and elements of the news article by using a range of warm and cold colors. The default settings from the Tobii I-VT (Fixation) gaze filter were used across the study with a radius of 50 pixels, corresponding to a total kernel of 100 pixels. The setting type selected was absolute count. The maximum scale value was 15.00 counts. The red areas on the heat maps indicate the sections the participants looked at particularly intensively (see Figures 1 and 2).

Figure 1. Overview of heat maps for high article quality

Note. Negative comments (left), positive comments (right); Photograph: Florian Gaertner/Photothek Media Lab/Imago.

Figure 2. Overview of heat maps for low article quality



Note. Negative comments (left), positive comments (right); Photograph: Florian Gaertner/Photothek Media Lab/Imago.

The heat maps show that the participants concentrated primarily on the textual areas of the stimuli. Hardly any attention was paid to the image – across all four stimulus variants – with only the 130 kph speed limit sign receiving occasional attention. The image was viewed for an average of 4.35 seconds. The headline was also apparently only skimmed, with participants focusing on it for an average of 2.64 seconds.

Regarding the rest of the text, differences between the stimulus variants can be identified. As the stimuli with a higher-quality article are longer, participants spend more time than average on those stimuli than on ones in a lower-quality article. However, for the third section of the text, which is the same in both stimulus variants, it can be seen that participants viewing a high-quality article fixate on it for longer on average (M = 46.95; SD = 14.88) than participants who were shown a low-quality article (M = 39.96; SD = 14.08).

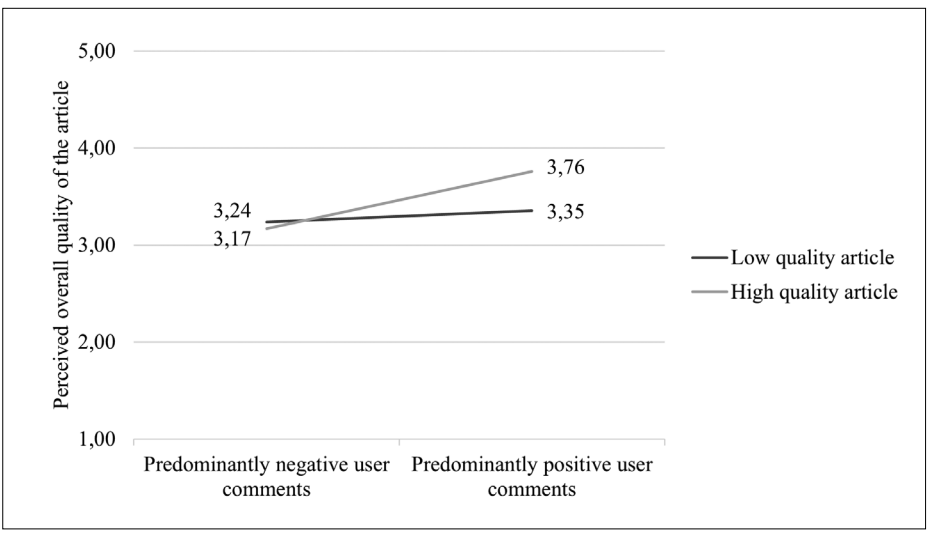
The opposite can be seen in the comment section below the article. Noticeably, the articles with positive comments were read more intensively. This finding is particularly surprising because negative comments (M = 35.13; SD = 20.82) were read much more intensively than positive ones (M = 23.15; SD = 18.62). In addition, the heat maps illustrate that participants paid particular attention to the first comment for all stimulus variants, while less attention was paid to the other comments.

Hypothesis 1 postulates that readers pay more attention to negative comments than to positive ones. A two-sample t-test was performed to test this and to compare users' attention on negative and positive comments. The results revealed a statistically significant mean difference (t(142.97) = 3.657; p < .001). On average, readers looking at negative comments fixate on them for longer (M = 35.13; SD = 20.82) than users looking at positive comments (M = 23.15; SD = 18.62). Therefore, the proposed hypothesis can be supported.

According to Dohle (2018) and Urban and Schweiger (2014), the article's journalistic quality is measured with seven quality dimensions. Regarding the effect of the comments on these individual quality dimensions, we assume that positive reader comments affect the perception of the quality dimensions in a positive way (H2).

To test this hypothesis, a two-way analysis of variance was conducted, including the quality of the article (high vs. low) and the comments (positive vs. negative) to analyze interaction effects. Figure 3 and Table 2 show the differences in the participants' ratings.

Figure 3. Interactive influence of the article's quality and the user comments on the evaluation of the article's perceived overall quality.



Note. 1 = low quality, 5 = high quality; n = 143 (cases used, excluding missing values; N = 145).

The participants rated the high-quality article with positive comments as having the best quality on average (M = 3.76; SD = 0.75). In the other three groups, the quality of the respective article was rated lower on average. These differences are statistically significant (p = .15). At the same time, the overall quality of the high-quality article version (M = 3.43; SD = 0.90) is only slightly better evaluated than the low-quality version (M = 3.29; SD = 0.85). The individual analysis of the seven quality dimensions also shows that the high-quality article with positive comments was rated best in almost all subdimensions except relevance and impartiality. However, the subdimensions in these four groups show no statistically significant mean differences.

Table 2. Participants' perception of the article's journalistic quality according to the four stimulus variants

Quality dimension	High article quality/ negative comments *M* (*SD*)	High article quality/ positive comments *M* (*SD*)	Low article quality/ negative comments *M* (*SD*)	Low article quality/ positive comments *M* (*SD*)	*F*	*p*
Overall quality	3.17 (0.94)	3.76 (0.75)	3.24 (0.92)	3.35 (0.77)	3.33	.02
Relevance	3.43 (0.91)	3.64 (1.08)	3.68 (1.12)	3.42 (1.05)	0.62	.61
Accuracy	3.86 (0.68)	4.06 (0.75)	3.65 (1.04)	3.58 (0.81)	2.38	.07
Comprehensibility	4.10 (1.01)	4.36 (0.78)	4.18 (0.72)	4.06 (0.89)	0.86	.46
Impartiality	2.29 (1.04)	2.52 (1.18)	2.59 (1.44)	2.31 (0.95)	0.62	.61
Ethics	3.69 (1.09)	4.06 (1.12)	3.79 (1.01)	3.64 (1.13)	1.03	.38
Transparency	3.12 (0.97)	3.58 (0.97)	3.12 (1.12)	3.47 (0.81)	2.15	.10
Diversity	2.55 (0.83)	2.82 (0.92)	2.44 (0.96)	2.69 (0.89)	1.16	.33

Note. Results of analysis of variance: 1 = low quality to 5 = high quality; M = mean, SD = standard deviation; N = 145 ("Overall quality" with n = 143 due to missing values).

Comparing the user comments condition, the article's overall quality was evaluated better for the high-quality article version. The low-quality article was also evaluated as slightly better under the negative comments condition. There was no statistically significant interaction effect for the overall quality ($F(1, 139) = 2.709$, $p = 0.10$; $\eta_p^2 = .02$) or for any of the specific quality dimensions. However, the influence of the article's quality on the evaluation of its accuracy was statistically significant ($F(1, 141) = 6.265$, $p < .05$; $\eta_p^2 = .04$), as was the influence of the user comments on the perceived transparency ($F(1, 141) = 6.271$, $p < .05$; $\eta_p^2 = .04$).

6. Discussion and conclusion

User comments have been a well-established part of news websites as an audience feedback mechanism for over 20 years. Therefore, they will continue to influence readers' perception of news articles. This study examined the influence of user comments on the perception of journalistic quality from the audience's perspective using eye-tracking measurement technology and survey data. In this respect, (1) the participants' level of visual attention and (2) different journalistic quality dimensions were measured.

Building on previous research about the perception of journalistic quality and the influence of user comments, the valence of such comments (negative vs. positive) and several different normative news quality criteria were explored through an online survey and an eye-tracking experiment with 145 participants in Germany.

This perspective warrants special attention, as user comments and comment sections remain a double-edged sword. On the one hand, they are spaces for participatory discourse among the audience and with media outlets. On the other hand, the ever-blurrier boundaries between constructive criticism and "dark participation patterns" (Frischlich et al., 2019) pose new challenges to media organizations in the context of spillover effects on the perception of news quality.

The RQ dealt with the fixation duration on the articles. The results show that a high-quality article was fixated on for longer on average than a low-quality article. Further, articles with positive comments below them were read more intensively.

The findings indicate that high-quality articles are more likely to captivate readers' interest and maintain their attention throughout the reading process compared to low-quality ones. Articles with accurate information, a clear structure, and compelling narrative are inherently more engaging and may encourage readers to spend more time absorbing the content (Gladney et al., 2007). At the same time, a deeper processing and cognitive effort from readers might be required. In contrast, low-quality articles may fail to capture readers' interest due to poor writing, factual inaccuracies, or lack of coherence, which lead to quicker processing and shorter fixation durations as readers quickly lose interest and disengage.

Regarding the influence of positive comments on reader engagement, positive comments may create a favorable context for the article, enhancing readers' expectations and predisposing them to perceive the content more positively. This positivity bias might lead readers to approach the article with a more open mind, increasing their motivation to engage with the content and prolonging their reading time. Further, participants returned to the article after reading the positive comments, thus spending longer reading the article, with a spotted gaze path pattern showing where they specifically scanned for visual cues such as subheadings (see Pernice, 2019). Additionally, positive comments may serve as social validation, reinforcing the perceived value of the article and prompting readers to invest more attention and effort into understanding its content.

Regarding the first hypothesis, the results also indicated that readers paid more attention to negative comments than to positive ones, which aligns with previous research by Kohout et al. (2023). According to Bachleda et al. (2020), Rozin and Royzman (2001), and Unkelbach et al. (2020), there is also a negativity bias in

human perception of information, which means that they have a more substantial effect on human perception, memory, decision-making, and behavior than neutral or positive information. Therefore, negative content is more likely to be perceived as valid than positive news (Hilbig, 2009). Overall, the findings show that comments grab attention, and negativity in particular addresses the individual's need for orientation and thus acts as an orientation aid for recipients (Kümpel & Unkel, 2020).

The results further indicate that recipients' perception of the article's quality was in line with the manipulation of accuracy, comprehensibility, ethics, transparency, and diversity (Dohle, 2018; Urban & Schweiger, 2014). The participants rated the high-quality version of the article more highly than the alternative version, yet the differences are small. A possible explanation could be that while news consumers recognize differences in journalistic quality in general, and the accuracy of news articles in particular, they are less likely to identify differences between news articles that differ in their adherence to other quality criteria (Urban & Schweiger, 2014).

Regarding the second hypothesis, it was confirmed that positive reader comments affected participants' perception of specific quality dimensions. However, there is only a statistically significant effect of user comments on the perceived transparency of the article.

The explanations are manifold: Readers may experience cognitive dissonance (Festinger, 1957) when faced with information that contradicts their beliefs or attitudes, like the usefulness of a speed limit. As most participants (81.4%; n = 118) stated that they sometimes go over the speed limit, although it is socially desirable not to do so (Bailey & Wundersitz, 2019), positive user comments may help reduce cognitive dissonance by providing reassurance or validation of one's choices or beliefs, making readers more accepting of the article's merits. At the same time, "[c]ognitive dissonance will only play a role in the process of information selection if the topic is of some relevance to the individual" (Donsbach, 1991, p. 157). Readers recognize the presence of argument diversity, which also increases overall news satisfaction (Zerback & Schneiders, 2024).

Positive comments may also reinforce readers' preexisting expectations. Given that the article's topic and layout are similar to those of the quality news magazine *Der Spiegel*, the participants might subconsciously expect such a journalistic article to be of good quality. When they encounter positive comments about an article, especially if those comments align with their expectations, they might be more inclined to see the article as transparent or diverse.

Overall, the findings show that participants spend longer reading the high-quality article sections than the low-quality article ones, but this did not lead to vastly different quality perceptions. A reason might be that the measurement of quality perception relates to observable quality criteria (e.g., offering correct and precise information is indicative of accuracy) (Dohle, 2018; Urban & Schweiger, 2014). If participants only have vague conceptual knowledge about these criteria, they "might be unable to retrieve the relevant information from memory, which would hinder them from accurately assessing whether it complied with the respective journalistic standard" (Weber et al., 2019, p. 25). Moreover, as the user comments

in both article versions offered only slightly contrasting viewpoints and did not use particularly positive or negative wording, it can be assumed that this is the reason for the statistically small effects.

As a result, the process of news quality perception requires a nuanced understanding against the background of how readers actually pay attention to user comments accompanying an article in order to make informed statements about their influence. It can also be stated that comments matter for quality perception but not necessarily more than the actual quality of the article. The reason is that both comments and the perceived journalistic quality depend "on external factors, such as user variables (e.g., informational needs, behavioral intentions, and involvement) as well as the context variables" (Haim et al., 2018, p. 204).

As is always the case, this study is subject to some limitations. First, most participants are young, highly educated digital natives. Thus, they might have a more nuanced perspective around the perception of journalistic quality. Second, the findings rely on self-reported perceptions of journalistic quality. The accuracy of such self-reported measures can be influenced by various motivational or cognitive processes related to individual characteristics. Third, eye tracking does not provide insights into the intention or motivation for the participants to view certain visual stimulus areas or emotional or cognitive processes while they are receiving them.

Fourth, although a news brand was not mentioned, the layout was based on *Der Spiegel*'s website. On the one hand, this approach provides an opportunity to investigate perception from a particular real-life perspective; on the other, the participants may have recognized the layout anyway and the reputation of the familiar news brand could have implicitly influenced their perception of the article's journalistic quality. Fifth, since the manipulated news article was based on a news story from a high-quality German news magazine and the experiment followed Dohle's approach (2018), a pretest of the material was not considered imperative. In addition, familiarity with the issue was presumed, as the speed limit on Germany's autobahn network regularly comes up in public discourse (Puls & Wendt, 2021).

Future research could investigate factors such as the level of civility, relevance of the article, coherence, and overall sentiment expressed in user comments. Research could examine whether diverse perspectives within user comments influence the perception of journalistic quality. Another possibility might be to explore how the prominence of user comments within the article interface (e.g., placement, visibility) affects readers' attention allocation and interpretations of journalistic quality.

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