

# NewsChat: A Generative AI Conversational Agent to Enhance the Reading Experience of Data-Driven Articles

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**Abstract.** Data-driven articles have become an effective way to turn complex datasets into clear, engaging stories. However, this approach can produce dense articles filled with complex details and statistics, which may overwhelm readers. Interactive techniques like visualizations and scrollytelling help simplify content, but often lack personalization and adaptability. This study explores the integration of a Generative AI (GenAI) conversational agent in a data-driven article to simplify content and offer personalized explanations. Through an online experiment, we assessed how the GenAI agent affects the reading experience in this context. Our results reveal that the agent enhances enjoyment, particularly for individuals with limited interest in the topic. However, the agent may negatively impact perceived credibility, especially among those with skepticism towards chatbots. Thematic analysis of user comments revealed both positive perceptions of utility, alongside concerns about risks such as over-reliance, inaccuracies, and distrust in GenAI.

**Keywords:** Generative AI · Chatbot · ChatGPT · Data-Driven Articles · Personalization.

## 1 Introduction

Data-driven articles have become a vital method for translating complex datasets into comprehensible narratives, leveraging digital platforms to deliver increasingly interactive content [53]. By grounding stories in tangible data, this journalistic format enhances credibility and provides readers with a clear, transparent foundation for the claims made [38]. However, despite these advantages, data-driven articles often present a significant challenge: they tend to include dense material filled with complex statistics and analyses that readers need to interpret and understand [54].

Various solutions have been used over the years to tackle this complexity, including infographics and interactive visualizations, which transform raw data into compelling stories [57]. Furthermore, scrollytelling, a technique that combines storytelling with interactive visuals that unfold as the user scrolls, adds an immersive layer to complex narratives [51]. Tools like Flourish [18] and

Datawrapper [12] have popularized these methods, helping content creators to produce interactive, data-rich content [9]. Yet, these approaches often rely on static or semi-interactive frameworks that may not adapt to the specific questions or interests of individual readers, leaving many still struggling with data complexity [54].

A promising solution to this challenge is the integration of Generative AI (GenAI) into newspaper articles to support readers by simplifying complex information and offering personalized responses to their questions. Some news platforms are already experimenting with conversational GenAI for content synthesis and reader queries, such as The Washington Post’s "ClimateAnswers", which summarizes climate reporting with citations [15], and The Financial Times’s subscriber feature that offers responses based on two decades of content [16]. As argued by Horning et al. [26], enjoyment and credibility are particularly critical dimensions of this reading experience, reflecting the emotional appeal and perceived trustworthiness of news content. However, these dimensions remain underexplored in the context of using GenAI to support the reading of data-driven articles.

This study aims to explore this gap by integrating a GenAI conversational agent as a reading assistant within a data-driven newspaper article and investigating its impact on the reading experience. To achieve this, we developed NewsChat, a GenAI-powered chatbot embedded within an online newspaper article, designed to respond to individual queries in real time. NewsChat provides context-specific explanations, summaries, and additional insights related to the article’s content. Through this case study, we aim to provide initial insights addressing this overarching research question:

**RQ:** How does the integration of a GenAI conversational agent in a data-driven article impact the reading experience?

To answer this research question, we employed a mixed-methods approach [14] that integrated qualitative and quantitative data collection and analysis. Specifically, we used design thinking [4] for its ability to center on user needs, challenge assumptions, and uncover creative solutions. This approach allowed us to iteratively develop and refine NewsChat.

## 2 Theoretical Background & Related Work

Beyond its primary role of informing and engaging, data journalism also depends on the quality of the reading experience to shape how readers perceive and value the content [19]. Horning et al. [26] conceptualized enjoyment and credibility as particularly critical dimensions of the reading experience, drawing on theories of media consumption, source credibility, and interactive media design to explain how affective engagement and perceived trust shape user responses to digital news formats. As such, we focus on these dimensions in the present study. The rise of GenAI has introduced new ways for readers to engage with data-driven journalism, enabling more interactive and conversational experiences [47]. Research across various domains showed that interacting with GenAI tools like

ChatGPT can enhance perceived enjoyment by offering engaging, satisfying, and emotionally resonant experiences [21,31]. Such interactions have been associated with emotional connection, flow states, and sustained engagement in both educational and workplace settings [34]. Based on these findings linking GenAI use to perceived enjoyment, we formulate our first hypothesis:

**H1:** The presence of a conversational GenAI agent increases perceived enjoyment of a data-driven article.

Credibility is also considered a key concern when integrating conversational GenAI into news content. While some studies suggest that AI-generated information can be perceived as equally or even more credible than human-written content [36], concerns persist around factual inaccuracies and *hallucinations* in AI-generated content [30]. Moreover, machine-authored data articles are often viewed as less credible than human-authored ones [35]. Users also tend to trust GenAI tools like ChatGPT less than more established platforms like Google and Wikipedia, largely due to the lack of source transparency [28]. Given these concerns, particularly relevant in the context of data-driven articles, we propose the following hypothesis:

**H2:** The presence of a conversational GenAI agent decreases perceived credibility of a data-driven article.

While the presence of a GenAI agent may influence readers' enjoyment and credibility, these effects likely depend on individual differences, particularly attitudes toward chatbots. Prior research shows that such attitudes shape how users perceive and adopt conversational technologies [48], influencing outcomes like enjoyment[5] and credibility[56]. As for GenAI-powered chatbots, some studies emphasize their benefits for personalization and productivity [3], while others point to concerns about reliability, transparency, and misinformation [47]. These contrasting perspectives suggest that user attitudes may shape how GenAI is received in the context of data-driven articles. Based on this, we propose the following hypotheses:

**H3a:** Positive attitudes toward chatbots are associated with higher perceived enjoyment when using a GenAI conversational agent in a data-driven article.

**H3b:** Positive attitudes toward chatbots are associated with higher perceived credibility when using a GenAI conversational agent in a data-driven article.

Another factor that may shape readers' responses to GenAI in data-driven articles is topic interest. Prior research showed that individuals who are more interested in a topic tend to experience greater enjoyment and engagement [55], and are also more likely to perceive related information as more credible [41]. For data-driven articles, readers' varying levels of interest in a topic could influence their perceptions of enjoyment and credibility of the content [29,54], suggesting it may moderate the impact of GenAI on the reading experience. Accordingly, we formulate the following hypotheses:

**H4a:** Higher topic interest is associated with higher perceived enjoyment when using a GenAI conversational agent in a data-driven article.

**H4b:** Higher topic interest is associated with higher perceived credibility when using a GenAI conversational agent in a data-driven article.

### 3 Solution

To help readers navigate the dense content often found in data-driven articles, we aimed to design a more interactive and personalized reading experience. Our goal was to examine how allowing readers to chat with a GenAI agent about the article might support their reading experience and shape their perceptions of it. This led to the development of NewsChat (see Figure 1), a GenAI-powered agent embedded within a data-driven article, offering real-time explanations, summaries, and clarifications tailored to the article’s content. NewsChat is designed to be content-aware, enabling it to respond to user queries by drawing from the rich volume of data embedded within the article. It was developed using standard web technologies, including HTML, CSS, and JavaScript, to ensure integration with existing online newspaper platforms. The conversational agent was embedded directly into the layout of an online article inspired by a real-world example. It is powered by OpenAI’s GPT-4o [39], providing advanced natural language processing capabilities that enable it to understand and respond to user queries. The agent was made aware of the content of the online article, including the content of all associated graphs and data, through an initial prompt that provided the article’s content to the LLM in a JSON payload [6].

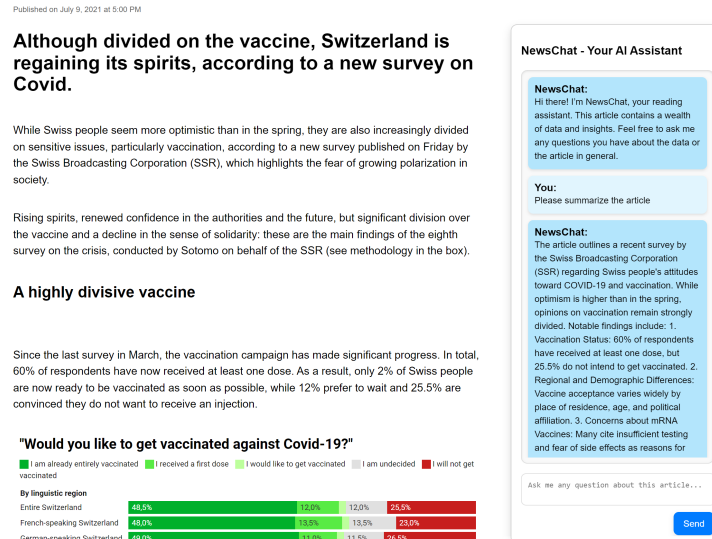


Fig. 1: NewsChat Interface.

We used prompt-tuning [8] to adapt NewsChat for more context-aware responses, guiding it to answer only within the scope of the article. The prompt was developed iteratively by testing variations in ChatGPT, following best practices from [33]. It instructed the assistant to respond to article-related questions, clearly flag additional insights, and maintain a helpful, friendly tone. Responses default to English (but adapt if prompted), and the assistant is directed to gently refocus off-topic queries and keep replies concise.

## 4 Experiment

To assess the impact of NewsChat, we selected a data-driven article from a database of over 600 data articles compiled for another study. We selected an article published during the COVID-19 pandemic in an online newspaper because it is particularly rich in visual and numerical information, featuring six graphs and hundreds of data points, making it a good test scenario for this assessment.

### 4.1 Participants & Procedure

We recruited participants via Prolific, targeting English-speaking individuals. They completed the survey on Qualtrics and provided consent. After pre-test questions, participants were told they would read an online article and were randomly assigned to either a *control group* (article without chatbot) or a *GenAI group* (article with NewsChat). They then completed post-test questions. The median completion time was 11 minutes and 35 seconds; participants were compensated £9.32/hour. The study was approved by the university’s ethics board. Initially, 303 participants completed the survey (155 control, 148 GenAI), but 55 were excluded due to a technical error from OpenAI’s API, an issue we did not foresee during pilot testing. The excluded participants had similar pre-test attributes (age, gender, chatbot attitudes) to those retained, minimizing potential bias. The final sample ranged from 18 to 77 years (mean age = 37) and included 52% females, 46% males, and 2% non-binary participants. Demographics were balanced across groups.

### 4.2 Metrics

We used established scales to assess the impact of NewsChat on the reading experience. Enjoyment was measured using items from the Enjoy scale [13], with participants rating their experience on a 5-point Likert scale ("Strongly disagree" to "Strongly agree"). Credibility was assessed using items from [58], which evaluate trustworthiness, believability, and honesty, also on a 5-point Likert scale. Topic interest was measured by asking participants to rate their interest in COVID-19-related online articles on a 7-point Likert scale. Attitudes toward chatbots were adapted from the General Attitudes towards Robots (GAToRs) scale [32], focusing on trust, comfort, and general positivity toward chatbots and their developers, using a 7-point scale. Usability was evaluated using the AttrakDiff scale [23], which measures pragmatic and hedonic quality as well as overall attractiveness.

## 5 Evaluation Results

To validate our hypotheses, we used partial least squares (PLS) analysis, using SmartPLS (version 4.1.0.0). PLS is a statistical analysis technique used primarily for structural equation modeling (SEM) [22], which allows the evaluation of complex relationships between observed and latent variables. PLS operates by constructing a path model that visually represents the hypotheses and relationships among variables. It is commonly used across various research domains, such as HCI [40,44], information systems [11], and marketing [49,50]. We used t-statistics to assess the standardized path coefficients ( $\beta$ ). To ensure robustness in the PLS analysis, we employed a bootstrapping method with 5000 resamples. The results of this analysis are presented in Figure 2.

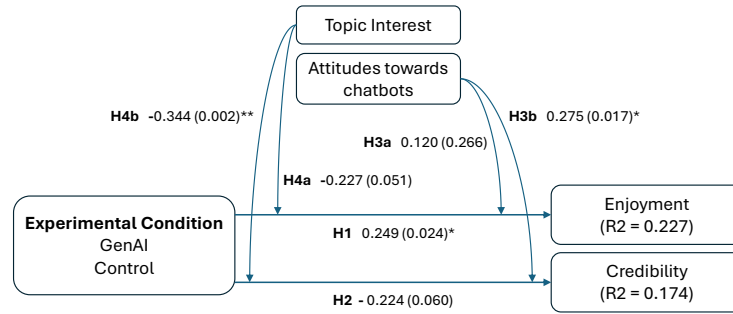


Fig. 2: PLS Model Results (\* $p < 0.05$ , \*\* $p < 0.01$ ).

### 5.1 The Impact of a GenAI Conversational Agent on Perceived Enjoyment and Credibility (H1 and H2)

The PLS model shows that introducing a GenAI conversational agent led to a significant increase in perceived enjoyment of the news article, with a positive relationship between the experimental condition and enjoyment ( $\beta = 0.249$ ,  $p = 0.024$ ). Participants in the GenAI condition experienced a higher level of enjoyment ( $M = 3.56$ ,  $SD = 0.86$ ) compared to those in the control group ( $M = 3.28$ ,  $SD = 1.09$ ). Therefore, H1 is supported.

In contrast, the presence of a GenAI conversational agent had a negative, though marginally significant, effect on perceived credibility ( $\beta = -0.224$ ,  $p = 0.060$ ). The mean perceived credibility for the GenAI group was 3.88 ( $SD = 0.60$ ), compared to 4.00 ( $SD = 0.62$ ) for the control group. However, this effect was not statistically significant, indicating a trend rather than a definitive result. Therefore, H2 is not supported.

Further analysis of the news website usability, using the Attrakdiff scale, provided additional insights about the readers' experiences across groups. The results (shown in Table 1) showed significantly higher Hedonic Quality – Stimulation (HQ-S) scores in the GenAI group ( $p = 0.019$ ), suggesting that the GenAI

group perceived the reading experience as more exciting and stimulating. Other dimensions did not show significant differences.

Dimension	Control Group	GenAI Group	t-stat	p-value
	Mean (SD)	Mean (SD)		
Attractiveness (ATT)	10.01 (2.47)	10.54 (2.21)	-1.75	0.081
<b>Hedonic - Stimulation (HQ-S)</b>	<b>8.79</b> (2.89)	<b>9.65</b> (2.68)	-2.37	<b>0.019</b>
Hedonic - Identity (HQ-I)	9.31 (2.36)	9.80 (2.03)	-1.72	0.087
Pragmatic (PG)	20.74 (4.53)	21.06 (4.12)	-0.57	0.566

Table 1: AttrakDiff scores across groups ( $p < 0.05$  in bold).

## 5.2 The Moderating Role of Attitudes Toward Chatbots and Topic Interest (H3 - H4)

Hypothesis H3a explores the associations between prior attitudes toward chatbots and perceived enjoyment when using a GenAI conversational agent. The analysis reveals that positive attitudes toward chatbots are not significantly associated with higher perceived enjoyment when using a GenAI agent ( $\beta = 0.120, p = 0.266$ ). Therefore, H3a is not supported. In contrast, for H3b, positive attitudes toward chatbots are significantly associated with higher perceived credibility when using a GenAI agent ( $\beta = 0.275, p = 0.017$ ). This finding supports H3b.

Regarding topic interest, H4a shows a marginal negative association ( $\beta = -0.227, p = 0.051$ ) between topic interest and perceived enjoyment. Therefore, H4a is not supported. Finally, the analysis suggests a significant negative association between topic interest and perceived credibility ( $\beta = -0.344, p = 0.002$ ). However, H4b is not supported, since it reflects a significant *inverse* relationship that contradicts our original hypothesis.

In the following, we focus on the significant interactions (H3b and H4b). For better clarity and visualization, we performed median splits on attitudes towards chatbots and topic interest, categorizing participants as either having low or high levels of attitudes and interest. Table 2 shows the results of these splits.

Table 2: Results of Median Splits for Attitudes towards Chatbots and Topic Interest (IQR = Interquartile Range).

Condition	Attitudes towards chatbots			Topic Interest		
	Median	IQR	Count	Median	IQR	Count
<b>Control - Low</b>	3.2	2.75 - 3.6	80	3.0	2.0 - 4.0	73
<b>Control - High</b>	4.8	4.4 - 5.3	75	5.0	5.0 - 6.0	82
<b>GenAI - Low</b>	3.2	2.4 - 3.6	47	3.0	2.0 - 3.75	42
<b>GenAI - High</b>	4.7	4.4 - 5.2	46	6.0	5.0 - 6.0	51

Figure 3 illustrates the interactions for these hypotheses. For H3b, perceived credibility increases more steeply with positive chatbot attitudes in the GenAI group compared to the control, with a noticeable drop in credibility for GenAI participants holding negative attitudes. For H4b, perceived enjoyment is similar across groups when topic interest is high, but among those with low interest, the GenAI group reports higher and more stable enjoyment. Both interactions were statistically significant, as confirmed using the PROCESS macro [24] (H3b:  $\beta = 0.082, p = .028$ ; H4b:  $\beta = -0.423, p = .004$ ).

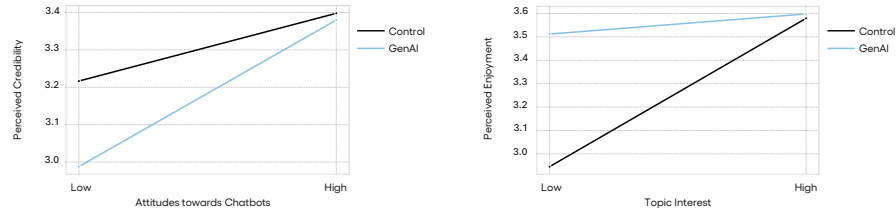


Fig. 3: Interaction effects across groups: attitudes towards chatbots and perceived credibility (left), and topic interest and perceived enjoyment (right).

## 6 Qualitative Analysis of User Experience

We conducted a thematic analysis of comments from the GenAI group to better understand participants’ experiences with the chatbot, following Braun and Clarke’s approach [7]. Two researchers first familiarized themselves with the data and developed initial codes. One researcher then coded all comments, which a second reviewed for consistency. Through collaborative discussion, the team refined and finalized four key themes. These reflect both positive impressions, such as usefulness and emotional engagement, along with concerns, including over-reliance, hallucinations, and distrust.

**Perceived Utility and Positive Reactions** Participants widely appreciated the chatbot for enhancing their understanding of the complex article. Many highlighted its clarity and speed, with one noting it was “helpful to say the least,” and another describing it as “a very useful tool to quickly get help understanding something you might not understand while reading an article.” Its adaptability to individual learning styles was also praised: “It helps me to get the information across in the way I digest it best (summary first).” In addition to its utility, the chatbot elicited positive emotional responses. One participant shared, “I love this idea. It can really be useful,” while another reflected, “I enjoyed the inclusion of a chatbot on the page.” Participants also mentioned increased engagement, with one stating, “It made it more likely for me to engage more if I had additional questions or interest.”

**Concerns About Accuracy, Over-reliance, and Hallucination** Despite the positive feedback, several participants raised concerns about the chatbot’s limitations and potential risks. One common concern was the possibility of over-reliance on the chatbot, with a participant cautioning, “Users might become too reliant on the AI, missing out on the broader context or critical thinking opportunities.” Participants also questioned the accuracy of the information provided by the chatbot. One user stated “I worry if you ask a question that the article is lacking an answer to, the AI will pull information from a different, possibly inaccurate, source.” Some participants pointed out the chatbot’s limitations in understanding and interpreting statistical data, with one stating, “It may be lacking when trying to understand why the stats are what they are or when coming to its own conclusions.” Additionally, the risk of AI hallucination was flagged as a significant concern. One user remarked, “The use of AI gives me pause because of the potential for AI to hallucinate facts or misinterpret parts of the article.”

**Skepticism, Distrust, and Bias in AI** A notable theme that emerged was skepticism and distrust toward AI in general. Some participants expressed significant concerns about AI chatbots, with one participant stating, “I distrust all chatbots and think they are a huge problem and shouldn’t be used.” Even participants who recognized the chatbot’s usefulness expressed difficulty in fully trusting it, with one stating, “I think it is a great tool, but I have a problem completely trusting it is giving all important information when asked to summarize.” Concerns about AI bias also surfaced, as participants worried that the chatbot could present information selectively or skewed. One participant remarked, “You never know with AI—they can be biased,” while another added, “It could be programmed with bias that highlights only certain points of an article.” For some, this distrust extended to a complete rejection of AI in such contexts, with one user concluding, “I am opposed to the use of AI chatbots as reading assistants for online articles.”

## 7 Discussion & Conclusion

In this paper, we implemented and evaluated NewsChat, a GenAI conversational agent embedded within a data-driven news article to function as a personalized reading assistant. We assessed the agent’s impact on the reading experience, specifically enjoyment and credibility, through an online experiment involving 248 participants. Findings from the PLS model showed that introducing a GenAI agent in the news article significantly boosted enjoyment, consistent with studies on the role of enjoyment in user engagement with complex content [31,21]. The Attrakdiff results consolidated this finding by showing that users in the GenAI group found the reading experience to be more stimulating. The thematic analysis also confirmed this, with participants appreciating the agent’s ability to provide interactive and customized features, such as summaries of dense data and targeted clarifications, aligning with research on how interactivity enhances

satisfaction and enjoyment [45]. These results also resonate with theories of active learning, where engagement and interactivity have been shown to enhance enjoyment and satisfaction by making the user experience more interactive and tailored to individual preferences [25,2].

Our results also suggest a trend where the presence of a GenAI conversational agent is associated with a decrease in perceived credibility, though this effect was only marginally significant. This aligns with previous research, which noted that while AI-generated content can be efficient and personalized, it often raises concerns about ethical issues surrounding its use [30]. Such concerns may be accentuated in contexts like data journalism, where credibility and data accuracy are crucial [38]. Our thematic analysis revealed concerns about AI hallucinations or misinterpretation of complex datasets, a known issue with generative models [43]. Participants also worried about over-reliance on AI reducing critical thinking, and highlighted skepticism toward AI chatbots in data journalism, questioning their reliability and transparency. The lack of trust in the conversational agent used in this study may stem from a broader skepticism about AI highlighted in existing literature [10]. To address these concerns, researchers have proposed several guidelines, including establishing clear policies and fostering interdisciplinary collaboration to promote transparency, accountability, and fairness in AI systems [1]. Additionally, the literature emphasizes the importance of robust data security measures and comprehensive AI training programs [37].

Moreover, our results indicate that individuals' perceptions of enjoyment vary significantly depending on their level of interest in a topic (COVID-19 in this case), aligning with prior research [55]. Interestingly, our findings suggest that the GenAI agent was particularly beneficial for individuals with low interest in the topic, contrasting with prior literature that suggests data-rich articles are better received by already interested readers [29,54]. It remains unclear why the GenAI agent improved the experience of the less interested readers. It is possible that introducing a stimulating element may have mitigated their initial disinterest in the original topic and potentially contributed to increased enjoyment, in line with prior literature [52]. Nevertheless, future research should further explore these dynamics to better understand how GenAI agents impact the enjoyment of data-heavy articles based on user interest levels.

Furthermore, our findings suggest that individuals with pre-existing negative attitudes toward chatbots are more likely to perceive the data-driven article as less credible when a GenAI agent is introduced. Building on previous studies reporting reduced credibility with GenAI [17,20], our results emphasize the influence of individuals with pre-existing negative attitudes in driving this effect in the context of data journalism. Future research could explore strategies to mitigate these preconceptions, such as tailored user education, framing techniques, or transparency measures, aimed at fostering more positive initial interactions with GenAI [37].

Findings from this study present several practical implications. First, the GenAI agent's ability to enhance enjoyment suggests that newsrooms could leverage this technology to create a more engaging and enjoyable reading experience

for their audiences. However, the associated decrease in perceived credibility underscores the importance of implementing such tools with caution to maintain reader trust. Furthermore, the moderating roles of user attitudes toward chatbots and topic interest highlight opportunities for the personalization of conversational agents. Designers could consider adapting chatbot behaviors based on the users' level of interest in a topic and their attitudes toward AI. For example, chatbots could be designed to provide simplified explanations and summaries for less interested readers or adopt a more cautious, citation-rich approach for skeptical users [27,1]. Additionally, designers might also explore prompt-tuning to make chatbots deliver more audience-specific responses that resonate with the demographics, editorial style, and interests of the newspaper's readership [42]. However, personalization should be approached carefully to avoid creating filter bubbles that reinforce biases or detract from the main message of the article [46]. Designers should aim to strike a balance between enabling users to explore their own interests through the chatbot while still guiding them towards the core content, ensuring that the chatbot complements and augments the reading experience while preserving the integrity of the article's main message.

This study has limitations that should be acknowledged. First, it focuses solely on online newspapers, limiting the findings' applicability to other media platforms, and does not address mobile devices, despite their significant role in online newspaper readership. This study's short-term interactions may have increased enjoyment due to a novelty effect. Long-term studies could better assess whether this effect persists. Finally, the GenAI agent was pilot-tested on only one data-driven article. While the results offer valuable insights, further research across various articles and topics would be beneficial to confirm their broader effectiveness.

## Acknowledgements

This research was partially funded by the Swiss National Science Foundation (SNSF) under the NRP 80 project 408040\_210123.

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