

## The Attention-Information Trade-Off<sup>†</sup>

By MARTA SERRA-GARCIA\*

*How does information transmission change when it requires attracting the attention of receivers? This paper combines an experiment that varies freelance professionals' incentives to attract attention about scientific findings, with several online experiments that exogenously expose receivers to the content created. Attention incentives lead to significantly less information being transmitted, but not more factually inaccurate content. These incentives increase information demand and the knowledge of interested receivers. However, among the majority of receivers who do not demand more information, attention incentives lower knowledge and increase biases in beliefs, revealing a channel through which misperceptions can arise: missing information. (JEL C91, D83, D91)*

Knowledge isn't free. You have to pay attention.

—Richard P. Feynman

Attention is a scarce cognitive resource that is fundamental to decision-making in many settings (e.g., Simon 1971; Kahneman 1973; Krajbich, Armel, and Rangel 2010; Bordalo, Gennaioli, and Shleifer 2022; Loewenstein and Wojtowicz 2025). One such setting is the internet, where an important goal of stakeholders is to attract individuals' attention. The internet has been portrayed as “a battle for clicks and eyeballs” (Senior 2016; Wu 2017, ch. 22) among content producers, who seek clicks and the sharing of the information they post. The incentive to grab attention has raised concerns because of its potential impact on the accuracy of the information that citizens are exposed to and pay attention to online (Pariser 2011). Given these concerns, it is critical to carefully examine the relationship between attention and information transmission.

Important existing work has studied what kind of content attracts individuals' attention in online settings. It has shown that emotional and arousing content can receive more clicks and shares (e.g., Berger and Milkman 2012; Serra-Garcia and Gneezy 2021; Qiu and Golman 2024; Robertson et al. 2023), but also documented that predicting attention is difficult (Bakshy et al. 2011; Banerjee and Urminsky 2025).

\*Serra-Garcia: University of California, San Diego and CESifo (email: [mserragarcia@ucsd.edu](mailto:mserragarcia@ucsd.edu)). Devin Pope was the coeditor for this article. This research was conducted under IRBs #806238 and #161827 at the University of California, San Diego. This paper has benefitted from highly insightful comments from Jose Apesteguia, Russell Golman, Ian Krajbich, Sam Lindquist, George Loewenstein, Michel Marechal, Kirby Nielsen, John-Henry Pezzutto, Sally Sadoff, Joel Sobel, Hannah Trachtman, Isabel Trevino, Manu Vespa, as well as several seminar and conference participants. Wenxuan Cao, Haowei Li, Siqi Li, Wanting Zhou, and Jerry Zhu provided excellent research assistance.

<sup>†</sup>Go to <https://doi.org/10.1257/aer.20240850> to visit the article page for additional materials and author disclosure statement(s).

This paper contributes novel evidence by taking a step back and asking the following: How does the incentive to grab attention affect the content that is generated and, subsequently, the information that is transmitted? In an experiment that exogenously varies the incentives of freelance professional writers, the paper first studies how incentives to grab attention affect the supply of content, studying the content's accuracy, focus, and style. Then, leveraging online experiments that control individuals' exposure to content, the paper examines how content generated with incentives to grab attention affects individuals' knowledge, attention allocation and subsequent beliefs.

The paper studies information transmission about scientific findings, with a focus on four topics: cancer, sleep, vaccines, and climate. Information about these topics can influence important beliefs and behaviors, such as immunization choices or actions against climate change. But information about them can be false, incomplete, and misleading (e.g., Chou, Oh, and Klein 2018; Allen, Watts, and Rand 2024) and spread virally online (e.g., Vosoughi, Roy, and Aral 2018).

How attention incentives affect content and receiver behavior is *ex ante* unclear. First, these incentives could distort the information transmitted or reduce the amount of information transmitted. Distortion could occur if, to generate curiosity among readers, the content generated includes more false information about scientific findings (e.g., exaggeration). Alternatively, a reduction in the amount of information could arise if the content highlights what readers do not yet know and introduces information gaps (Loewenstein 1994; Golman and Loewenstein 2018). Information distortions or selective disclosures could in turn bias receivers' beliefs regarding the implications of the findings. Second, a scarcely examined effect of the incentive to grab attention is to increase readers' attention, which leads to the consumption of more information. This compensating effect of increased information demand is central to the attention-information trade-off.

To study the relationship between attention and information, the experimental paradigms in this paper are designed to align with important features of online attention markets, while preserving experimental control over the incentives of content producers and over the exposure to content of those receiving information. In the preregistered sender experiment, freelance professionals who specialize in writing social media copy or research summaries write a total of 595 summaries about recent research findings. These professionals receive written materials about four research articles and write summaries, consisting of a headline and a three-sentence description, with the incentive to inform receivers (Info-incentives), or to attract the attention of receivers in one of two ways. The first is to have receivers demand more information by clicking on a button that delivers detailed information about the research (Clickbait-incentives). The second is to create a summary that receivers believe is likely to be shared virally on social media, generating the "eyeballs" or views of many others (Viral-incentives). These two incentives focus on fundamentally different forms of attention, both of which are often discussed in the context of online communication.

To measure the impact of incentives on the content produced by senders, we adapt the method developed for political communication in Carlson (2018) to science communication. We provide senders with materials about several research articles. These articles have a consistent structure (introduction, methodology, findings, conclusions; see, e.g., Schimel 2012), and the materials serve as a benchmark to establish accuracy in information transmission. Content is classified according to

three dimensions: its accuracy, relative to the materials; its focus, whether it relates to the introduction, methodology, findings, or conclusion of the research; and its writing style, by quantifying changes in summary length, readability, sentiment, and punctuation use.

The sender experiment reveals three main effects of Clickbait- and Viral-incentives relative to Info-incentives. First, Clickbait- and Viral-incentives significantly reduce the amount of accurate information in summaries. The amount of inaccurate information that wrongly describes the research does not change. Rather, the amount of new content added by professionals, often to motivate and make the research relatable to readers, increases. Second, summaries increase their focus on introducing the research and reduce the amount of information about the methodology used. Third, summaries become more readable and shorter, with more than double the amount of exclamation and question marks.

In exploratory analyses, we examine *how* content changes. Clickbait- and Viral-incentives lead to content that is more likely to directly appeal to readers (using expressions such as “you will learn how to sleep better”). With Viral-incentives, we also observe a marginally significant increase in incorrect implications being drawn in the summary—claims that are not mentioned or follow from the materials (e.g., the reader should change their diet, although the materials note the findings are correlational).

The findings in the sender experiment suggest that attention incentives lead to a reduction in the amount of information about the research and to the introduction of new content that makes the research relevant to readers and could lead readers to derive incorrect impressions about its implications for behavior. An important limitation is that naturally occurring communication about research in online settings could differ from that within our experiment, in which professionals are hired to promote scientific findings for a broad audience. Among others, professionals may not feel as free to introduce distortions as individuals on their personal social media accounts. To shed light on the validity of the context, we explore the features of headlines in online content about the research articles. While the incentives of news, blogs, and social media content producers are heterogeneous and difficult to identify, we study how they describe the research and compare the distributions of features of headlines.

We find that the headlines written by professionals align in accuracy, focus, and writing style with those observed online. For example, the online headlines of news and blogs about the research articles are rarely classified as inaccurate relative to the research materials, but often as new content that relates to the topic more broadly, which is consistent with the findings for the headlines written by professionals.

We examine the impact of senders’ content using preregistered online receiver experiments. We measure receiver knowledge, attention allocation, and beliefs. We exogenously assign receivers to summaries written under different incentives and assess knowledge by asking the same multiple-choice questions about the research articles. Receivers are either only exposed to summaries or can click on summaries to learn more about the research. When receivers click to learn more, they receive the research materials that senders had and answer knowledge questions of which they had no prior awareness. We also vary whether receivers are asked to recall the information they received or have it available when measuring their knowledge, to capture whether incentives to grab attention affect recall (e.g., Zimmermann 2020; Graeber, Zimmerman, and Roth 2024).

We document three main results. First, when receivers are only exposed to summaries, those written with Clickbait- and Viral-incentives lead to significantly lower receiver knowledge (6–7 percentage points (pp), or 10–11 percent). Simultaneously, Clickbait- and Viral-incentives increase click rates significantly, from 20 percent to 25 percent and 24 percent, respectively. Interested receivers are exposed to more information about the research and thereby achieve significantly higher knowledge. This illustrates the presence of a trade-off: less information in the summaries but higher click rates. These compensatory effects result in small losses in overall knowledge in our experiments, but could result in overall gains or losses in knowledge depending on the context.

Second, we document that recall may be an additional channel through which research information is “lost,” which reduces the impact of the incentive to grab attention. When receivers must recall the information they received, they make significantly more mistakes, especially about the sample and methodology, across all treatments, and the effect of the incentive to grab attention becomes significantly smaller.

Third, we focus on the large majority of receivers who were only exposed to summaries about the research. An open question is whether summaries written with Clickbait- and Viral-incentives are more likely to induce biased beliefs about the research and its implications. We address this question in two ways. First, we explore receivers’ mistakes about the sample involved in the study: They are more likely to erroneously think that the sample is representative of the US population when summaries were written with Clickbait- and Viral-incentives. Second, we conduct an experiment that measures receivers’ beliefs about doctors’ official recommendations and their intentions to suggest behavioral changes to others and apply them to themselves. The data show that receivers exposed to summaries written with Clickbait-incentives are more likely to believe doctors’ official recommendations align closely with the research findings, although in four out of five cases, the findings were suggestive and not officially recommended. Receivers are also more likely to self-report intended behavioral changes based on the research summaries. The findings with Viral-incentives are directionally similar, but not statistically significant.

Taken together, these results reveal that Clickbait- and Viral-incentives reduce the amount of information about research findings. While they increase information demand, they can leave receivers who do not demand information with incorrect impressions, thinking that the research is more applicable to them than it actually is.

This paper contributes to the existing literature on information transmission (e.g., Crawford and Sobel 1982) and a growing body of theoretical work studying limited attention (e.g., Bordalo, Gennaioli, and Shleifer 2016; Galperti and Trevino 2020; Chen and Suen 2023) by complementing existing experimental work that studies how attention scarcity affects decision-making and tests models of rational inattention (e.g., Caplin, Dean, and Martin 2011; Dean and Neligh 2023) and choice in complex environments (e.g., Kang et al. 2009; Smith and Krajbich 2018; Abeler, Huffmann, and Raymond 2023; Esponda, Oprea, and Yuksel 2023; Guan, Oprea, and Yuksel 2023). By focusing on the incentive to attract the attention of receivers, the paper complements prior research using sender-receiver games, in which receivers’ attention is assumed and senders are incentivized to influence the beliefs

and actions of receivers (e.g., Sanchez-Pages and Vorsatz 2007; Abeler, Nosenzo, and Raymond 2019; Deversi, Ispano, and Schwarzmann 2021; Jin, Luca, and Martin 2021; Thaler 2024) to study incentives such as persuasion and reputation concerns.

Growing concerns regarding the spread of misinformation—intentionally and unintentionally false or misleading information—make it important to better understand the fundamental drivers of online behavior. Related work has shown that individuals share false headlines, often inadvertently (e.g., Osmundsen et al. 2021; Pennycook and Rand 2021; Roozenbeek, Suiter, and Culloty 2023; Serra-Garcia and Gneezy 2021; Altay, De Araujo, and Mercier 2022; Acemoglu, Ozdaglar, and Siderius 2024), and that suppliers of content exhibit an intrinsic desire for clicks and attention (Srinivasan 2023). The findings in this paper show that incentives to attract attention need not lead to more inaccurate content when communicating about research findings. But, they decrease the amount of detailed information about the research and bring in their broader relevance, which can leave receivers with inaccurate beliefs about its implications for their behavior. This *missing* information about the research could be harmful and may represent a new channel through which misperceptions arise.

## I. Experimental Design

The experimental design consists of a sender experiment and several receiver experiments.

### A. Sender Experiment

*Setting.*—The sender experiment was conducted with freelance professionals, who participated in the role of senders and were asked to submit four summaries of a research article. The freelance professionals were recruited on Fiverr, a large online platform for freelance services with over 4 million buyers in 2022. We recruited 149 freelancers specialized in writing services, within “social media copy” and “research and summaries,” and collected a total of 595 summaries (Serra-Garcia 2026). The recruitment was done in two waves (108 freelancers in January–February 2023 and 41 in February 2024, due to the recruitment process hitting limits to the availability of freelancers within budget during the first wave). Since there were no differential treatment effects by wave of data collection, the data for both waves are pooled and an indicator for wave is included in the empirical analysis.<sup>1</sup>

Emulating a typical writing task, freelancers were first contacted about their interest in writing about cancer, sleep, climate and vaccine research, and offered a payment based on their posted prices on the platform. Interested freelancers started the task and received detailed instructions, which depended on the treatment (described in Section IA). On average, they received \$19.1 ( $SD = \$4.5$ ), with \$20 being the

<sup>1</sup>One sender wrongly submitted the same summary for two articles. Detailed information on the implementation, recruitment waves, instructions, and materials given is provided in Supplemental Appendix A. Freelancers were restricted to be based in the United States, Canada, and the United Kingdom.

median and most frequent payment (56 percent of cases). In what follows, the freelancers are referred to as “professionals.”

Professionals’ public profiles (available for 138 of them) reveal that 90 percent had experience in writing, with 67 percent mentioning experience in work to attract attention, and 56 percent working in the digital domain.<sup>2</sup> These writers are mainly focused on writing anonymous online person-to-person or business-to-person content. They are not journalists and reputational incentives or outlet-focused incentives (e.g., Gentzkow and Shapiro 2008) are not central to them. Their typical incentive is to write appealing and attention-grabbing content.

Since large language models (LLMs) could produce content like professionals, in a complementary experiment we use an LLM (GPT-3.5) that acts as sender to generate 360 summaries with different objectives. The resulting content and its consequences on receiver beliefs and attention are qualitatively similar to those documented in the main experiment with professionals, as discussed in Section IIC and Supplemental Appendix F.1.

*Treatments.*—The experiment consisted of three between-subject treatments. The wording of the instructions and incentives in each treatment were chosen to align closely to wording used on the platform (instructions are provided in Supplemental Appendix Section A.2). In all treatments, professionals were told that the goal of the task was to inform the general public about research findings, which may be posted on social media. They also received explicit goals and financial incentives, as follows:

- In the Info-incentives treatment, senders were asked to “provide accurate information to potential readers.” They could receive an additional \$5 depending on a reader’s accuracy, which was described to them as “I’ll ask someone else to read one of your summaries, and if he/she answers several questions about the research correctly, as a pretest, I’ll tip you.”
- In the Clickbait-incentives treatment, senders were asked to “stimulate readers to read more about these research articles.” They could receive an additional \$5 depending on a reader’s click decision, which was described to them as “I’ll also ask someone else to read one of your summaries and several others. If he/she chooses to read more about the research you summarized, as a pretest, I’ll tip you.”
- In the Viral-incentives treatment, senders were asked to “maximize the number of times ... (their writing) is shared.” They could receive an additional \$5 depending on a reader’s belief about sharing, which was described to them as “I’ll also ask someone else to read one of your summaries and others that I am collecting and if he/she believes yours would be one that is shared most often, as a pretest, I’ll tip you.” Beliefs rather than actual sharing were chosen to avoid the spread of misleading or incorrect information. Sharing beliefs are in

<sup>2</sup>For example, one of their profiles stated “I’ve written over 1,000 articles in my time as a writing specialist, and I can help you find the right, creative words to keep your readers engaged.” The content analysis was done by two independent coders. In addition to expertise categorization, they coded the reported experience in writing. 50 percent of profiles report experience and 35 percent report an exact number in years. The average experience reported is 7.5 years (SD = 4.1).

line with online sharing as discussed in Supplemental Appendix E.5 (see also, Mosleh, Pennycook, and Rand 2020).<sup>3</sup>

When initially contacted, senders were told that summaries would consist of approximately 70–100 words. Upon starting the task, they received one to two pages about each research article which included, at the bottom, two spaces labeled “headline (with a maximum of 140 characters)” and “three-sentence summary.” These guidelines provided clear expectations but longer summaries were approved. Consistent with senders understanding this flexibility, the length of summaries varies significantly across treatments. Posts on social media platforms also vary significantly in length, depending on the platform. Summaries in this study are comparable in length (96 words, on average) to those in LinkedIn (50–100 words) and shorter than a typical Twitter thread (120–180 words; Pitzalis 2022; LinkedIn 2023).

*Articles.*—The research articles were selected among articles featured in the *New York Times* in 2019, to feature topics, such as public health or climate, that could interest a broad audience. They were described to the senders via materials that had three elements: the abstract, containing specialist language; a press release, written for a broad audience to communicate with journalists and the public (e.g., National Academies of Sciences, Engineering, and Medicine 2017; Peters 2020);<sup>4</sup> and a link to the entire paper. Figure 1 summarizes the eight articles included in the experiment.

A potential concern in asking senders to summarize research relevant to public health behavior is that they could incorrectly report about it, and this could lead to harmful behavior among readers. To minimize this risk, the articles focused on how a healthy diet is related to lower skin cancer risk (Kim et al. 2019), potential cancer treatments (Lee et al. 2019), and reduced insomnia (Gangwisch et al. 2020); the benefits and safety of the measles, mumps, and rubella (MMR) vaccine (Mina et al. 2019 and Hviid et al. 2019); and the importance of reducing deforestation and of wildlife protection (Maxwell et al. 2019, and Berzaghi et al. 2019). After a job started, senders received the materials, including a brief consent form, which informed them that their jobs were part of a research study. If this information increased concern for accuracy, the measured impact of Clickbait- and Viral-incentives could represent a lower bound in the types of inaccuracies that may be expressed in other settings, which motivates the comparison to naturally occurring online mentions of the articles (in Section IIB). Further information about the research articles, an example of the sender’s materials about the research, and an example of professionals’ summaries are provided in Supplemental Appendices A.4 and A.5.

<sup>3</sup> After the experiment, a subset of summaries was posted on Twitter, to act on what senders were told. The subset of summaries was selected carefully such that the summaries would not contain any incorrect information and reflected closely the materials provided to the senders. The posts were also accompanied by a link to the original research article, and the accounts informed users that the content posted was part of a research study.

<sup>4</sup> Existing work has descriptively documented “spin” in such communication (e.g., Yavchitz et al. 2012; Sumner et al. 2016), although it is also associated with better knowledge, in the context of cancer (e.g., Stryker et al. 2008). In this paper we exogenously vary senders’ incentives to identify how attention incentives affect content, keeping the materials used by senders constant.

Topic	Reference	Main finding	Sample	Analysis	Conclusions
1 Cancer	Kim et al. (2019)	Individuals with diets high in vitamin A have a 17% lower risk of squamous cell carcinoma (SCC), a form of skin cancer, than those with low vitamin A consumption.	Nurses' health (obs. = 121,700) and health professionals follow-up (obs. = 51,529) studies	Cohort study, longitudinal	The study authors suggest that the next step would be to conduct a clinical trial to test whether higher intake of vitamin A reduces the risk of SCC.
2 Cancer	Lee et al. (2019)	A molecule (I3C) in cruciferous vegetables reduces tumor growth because it inactivates a gene found in many cancers, the WWP1 gene.	Cancer-prone mice and human cells	Laboratory study	Individuals should not change their diets yet, as too large amounts of cruciferous vegetables (over six pounds a day) would be needed to prevent cancer.
3 Sleep	Gangwisch et al. (2020)	A diet high in glycemic index is associated with higher odds of insomnia among postmenopausal women.	Women's health initiative observational study, baseline (obs. = 77,869) and follow-up (obs. = 53,069), on postmenopausal women	Cohort study, longitudinal	The authors suspect that reducing refined carbohydrates in one's diet may be a low-cost way of preventing insomnia, but RCTs are needed.
4 Sleep	Perrault et al. (2019)	Participants fell asleep faster and had better memory the next day when sleeping on a rocking bed compared to a stationary bed.	18 healthy young adults	Laboratory study, within-subjects	Rocking is important for sleep quality and memory consolidation.
5 Vaccine	Mina et al. (2019)	Measles leads unvaccinated children to lose up to 73% of their protective antibodies for other diseases.	77 unvaccinated children in a community in the Netherlands	Event study, using VirScan to test blood samples	Measles vaccination is important to protect children from measles and other diseases.
6 Vaccine	Hviid et al. (2019)	The MMR vaccine is not associated with autism.	Danish population registry, (obs. = 657,461) children born in 1999–2010	Cohort study, longitudinal	Showing no association between the MMR vaccine and autism is important due to increase in vaccine hesitancy and measles outbreaks in Europe.
7 Climate	Maxwell et al. (2019)	Deforestation of intact tropical forests has a 626% stronger impact on carbon emissions than previously estimated.	Intact forest loss from 2000 to 2013	Computational	Intact forest retention needs to receive more attention and more funding from initiatives such as REDD+.
8 Climate	Berzaghi et al. (2019)	Forest elephants affect tree growth and aboveground biomass and, thereby, affect the carbon emissions of forests.	Field measurements in the Congo Basin in forests affected by elephants and in forests in which they had been eradicated	Field measures and computer simulations	Forest elephants should receive more protection and expand to help fight climate change.

FIGURE 1. ARTICLES

*Outcomes of Interest.*—We measure the impact of incentives on senders' writing across three sets of outcomes—accuracy, focus, and style—using text-based analyses. These outcomes were preregistered, and we add an index to summarize each set (not preregistered) following Anderson (2008) and Allcott, Gentzkow, and Song (2022). After examining the impacts on writing, we further examine the impact of incentives

on receiver knowledge and behavior in the receiver experiments (Section IB).<sup>5</sup> Throughout, to correct for multiple hypotheses testing, we use sharpened false discovery rate (FDR)-adjusted  $q$ -values, as in Benjamini et al. (2006); Anderson (2008); Braghieri (2024); and Graeber et al. (2024), applied to each set of outcomes.<sup>6</sup>

To analyze accuracy and focus, we build on the approach by Carlson (2018), developed to study political communication. First, each summary is divided into units of information. A unit of information is a statement that conveys a single, identifiable piece of information. It is often a sentence or a clause within the summary. Then, the content of the unit is separately analyzed with regard to its accuracy and its focus.<sup>7</sup>

*Accuracy.*—Establishing accuracy in naturally occurring communication is challenging, as it is difficult to identify the exact ground truth behind every statement. We measure accuracy by comparing senders' writing to the materials. Units are classified as follows:

- Accurate-in text: information from the materials that is correctly described.
- Inaccurate-in text: inaccurate information of two kinds: wrong—that is, explicitly incorrectly reporting what is in the materials, such as stating causation when correlation is described—or incomplete, leaving out important information. We pool both types of inaccuracy into “inaccurate-in text,” as they were observed in less than 10 percent of the cases.
- Not in text: information that is not provided in the materials.<sup>8</sup>

We construct an index to represent summary accuracy (*Accuracy index*), in which the number of accurate-in text units increase the index, while the variables capturing the number of inaccurate-in text and not in text units decrease the index value.

*Focus.*—Each unit is classified (Schimel 2012; Munch 2023) as (i) introduction—motivates the research and introduces the research question; (ii) method—describes the sample used and the analysis approach; (iii) finding—reports the findings; (iv) conclusion—describes the research implications and the authors' conclusions; and (v) call to action (CTA)—encourages the reader to click, read, or share. We summarize the focus of a summary using an index that combines the number of units

<sup>5</sup>Preregistered and additional analyses are described in Supplemental Appendix C for the sender experiment and within Supplemental Appendix E for the receiver experiments.

<sup>6</sup>Throughout, sharpened FDR  $q$ -values are computed using the two-stage Benjamini, Krieger, and Yekutieli (2006) procedure (Anderson 2008). Each  $q$ -value is the smallest FDR threshold  $q$  at which the coefficient is rejected. Unlike adjusted  $p$ -values, these  $q$ -values are FDR rejection thresholds and may be smaller than these for  $p$ -values below 0.15 (Braghieri 2024).

<sup>7</sup>The analyses were conducted by independent coders, who were blind to senders' incentives. Each summary was analyzed by two coders who discussed and reached an agreement on their coding. Coders' instructions are shown in Supplemental Appendix G. To verify the robustness of the coding results, GPT was used for coding. It provided qualitatively the same results, shown in Supplemental Appendix F.2.

<sup>8</sup>For example, we can consider the article by Hviid et al. (2019), which shows a lack of correlation between the MMR vaccine and autism using registry data in Denmark from children born between 1999 and 2010. A unit of information stated “this researcher diagnosed children with autism,” which is classified as wrong because researchers did not diagnose autism. Another unit stated “analyzed data from over 650,000 kids,” which is classified as incomplete, because it lacks the country and time range during which the data were collected. Finally, a unit stating “you must have heard of rumors about vaccines causing autism...” is not in text, because the materials did not refer to any rumors.

in each category (*Focus index*). Because the index aims to capture the amount of detailed information about the research within the summary, the number of method and finding units increase its value. The number of introduction, conclusion, and CTA units, which provide motivation and context, decrease its value.

*Writing Style.*—The third main outcome is writing style, which measures *how* the summary is written. It consists of four elements of style: (i) length, measured by word count; (ii) readability, based on Flesch’s Reading Ease Score (Flesch 1948), according to which high scores (90–100) indicate that the text is very easy to read; (iii) sentiment, which captures the tone of text (positive, neutral, or negative), using Sentimentr (Rinker 2023); and (iv) use of punctuation, which is an indicator variable if the summary uses exclamation marks, question marks, ellipsis, and hashtags, as well as icons (such as emojis).<sup>9</sup>

We construct an index that combines these style variables (*Style index*). A higher index value indicates a more attention grabbing style, with higher reading score and punctuation increasing the value of the index, and higher word count and more positive sentiment decreasing it (indicated as “ $x(-1)$ ”).

We also use these measures to analyze naturally occurring online mentions of the research. We use GPT to code accuracy and focus of headlines, after validating it with human coding (as described in Supplemental Appendix D). We use the same measures of style as above.

In exploratory analyses, we examine four additional outcomes that help in interpreting the main effects. First, we explore whether the summary mentions the sample used in the research article and, if so, how accurately it is reported. Then, we explore whether the summary directly appeals to readers, with words such as “you,” and whether it contains implications for receivers’ behavior and their accuracy. Supplemental Appendix C.3 provides details.

*Research Questions.*—The impacts of Clickbait- and Viral-incentives on the outcomes of interest vary depending on what motivates clicks and sharing. Clicks are a form of information demand that stems from igniting an individual’s curiosity (Loewenstein 1994), while sharing can be driven by a range of motives (see, e.g., Metzger et al. 2021; Osmundsen et al. 2021). For example, people may share altruistically to benefit others (e.g., Berger and Milkman 2012), to signal their identity to a wider audience (Barasch and Berger 2014), to build their own reputation and recognition online (e.g., Toubia and Stephen 2013; Smirnova, Reitzig, and Sorenson 2022; Niitsuma et al. 2025), or to ignite others’ emotions (e.g., Brady et al. 2017).

To induce clicks and sharing, senders could write summaries that violate expectations, providing information that deviates from what the reader knows or expects (Hebb 1949; Loewenstein 1994). Then, both Clickbait- and Viral-incentives could lead senders to introduce distortion, by writing summaries with more inaccurate-in-text units (e.g., exaggerations). Or, they could lead to selection in the information reported by increasing the number of (surprising) findings and conclusion units,

<sup>9</sup>Additional analyses that measure the effects of incentives on the presence of each type of punctuation mark, and on the count of each one, are shown in Supplemental Appendix C.2.

with more negative emotions to arouse readers (e.g., Berger and Milkman 2012), but not more inaccuracy.

Alternatively, Clickbait-incentives could have different consequences than Viral-incentives. Senders with Clickbait-incentives could choose to create information gaps that make salient what the reader does not know, as proposed in a model by Golman and Loewenstein (2018).<sup>10</sup> Readers would then click to gain information that closes the information gap. In that case, Clickbait-incentives could lead to summaries that contain fewer units with detailed information about the research—that is, fewer accurate-in text units, and fewer findings and conclusion units, but more introduction units to pose questions but not provide answers.

In both cases, we would expect Clickbait- and Viral-incentives to lead senders to focus on the broader relevance of the research, writing about their implications for readers, making them easy to understand (Kahneman 1973; Clark 2008), with higher readability scores and fewer (detailed and technical) methods units, relative to Info-incentives. By focusing on broader topics and selecting among features of the research findings, Clickbait- and Viral-incentives could induce biased beliefs in readers regarding how the research was conducted and how it is relevant to them.

The research questions are therefore as follows: Do Clickbait-incentives lead to “missing information” (information gaps) or “distorted information” (violating expectations)? Do Viral-incentives lead to “distorted information” or rather selection in reporting, by emphasizing findings and broad implications, without inaccuracy?

### B. Receivers: Experimental Design

The receiver experiments measure the effects of senders’ incentives on receivers’ knowledge, attention allocation, and beliefs. Detailed instructions are in Supplemental Appendix B.2.

*Knowledge and Attention Measurement.*—The goal of the knowledge and click experiments is to measure how the incentive to grab attention affects receiver knowledge and attention. To measure knowledge transmission separately from attention allocation, we implement experiments in which no clicks are possible (knowledge experiments) and receivers are only exposed to senders’ summaries, and experiments in which clicks are possible (click experiments) and receivers choose to learn more about the research, beyond senders’ summaries.

The incentive to grab attention could affect receiver knowledge over time in two ways. It could lead to content with differential amounts of information (e.g., less information with Clickbait- and Viral-incentives) or to content that results in differential recall (e.g., higher recall of content with Clickbait- and Viral-incentives). For that reason, we vary the need to recall the content across the knowledge and click experiments, as outlined in Figure 2 (a detailed design chart is shown in Supplemental Appendix B.1).

<sup>10</sup>This model was tested experimentally using puzzles and facial recognition tasks in Golman et al. (2022).

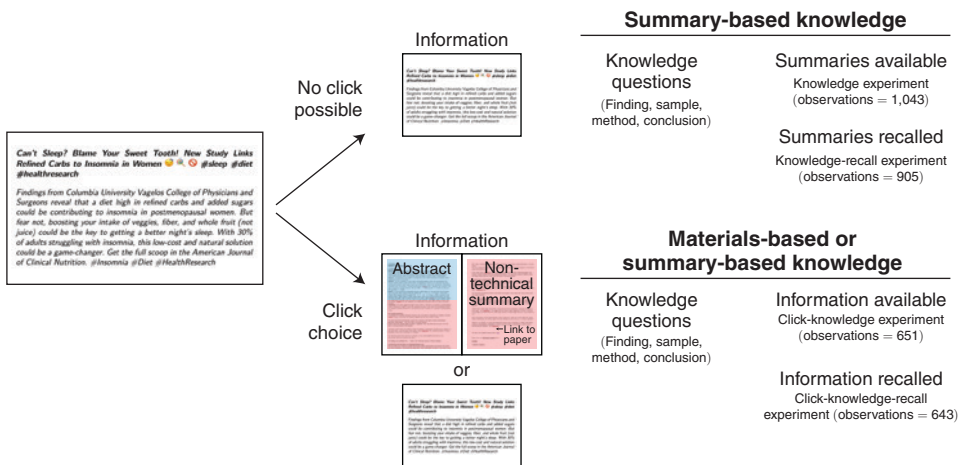


FIGURE 2. DESIGN OF RECEIVER EXPERIMENTS—KNOWLEDGE MEASUREMENT

*Knowledge Experiments.*—In these experiments, receivers are assigned summaries written under one incentive treatment (Info-, Clickbait-, or Viral-incentives) in the sender experiment. In the knowledge experiment, they answer knowledge questions having the summaries available on the same page. In the knowledge-recall experiment, they are first exposed to the summaries and, to ensure they pay attention to what they read, they write one sentence about each summary.<sup>11</sup> Then, they complete a second part of the experiment in which, unannounced, they are asked knowledge questions, without having the summaries available.

*Click Experiments.*—In these experiments, receivers are presented with a list of eight summaries, one for each research article (as a list of posts on social media would appear). They can click on any number of articles, from zero to eight, to receive more information. There is no financial incentive to click and receivers are not told what will happen after they receive more information. In this click stage, receivers are either presented with four summaries written with Info-incentives and four with Clickbait-incentives, or four summaries written with Info-incentives and four with Viral-incentives. This design allows to measure whether summaries written with Clickbait- or Viral-incentives are clicked on more often, relative to summaries written with Info-incentives. And, to address selection concerns, the receiver’s choice is implemented probabilistically, with a 75 percent chance. Receivers are aware that, with a 25 percent chance, the computer selects one article at random for the receiver to read about.

<sup>11</sup>The survey was programmed such that the summaries would appear as images and could not be easily copy-pasted elsewhere, such as into an LLM. We check the content of these sentences and find that the average sentence length is 16.2 words. There is significant variation, with the tenth percentile having 8 words and the ninetieth percentile having 27 words. We then check for the presence of one keyword per article in each sentence. For example, the keyword is “cancer” if the research article is about cancer. Between 71 percent and 97 percent of sentences contain the keyword that closely relates to the research article.

In the click-knowledge experiment, after receivers click, they are shown the materials about the research and asked to answer the knowledge questions, of which they had no prior notice. Both if the click choices are implemented or the computer implements one article, receivers only answer questions about articles they read more about. In the click-knowledge-recall experiment, there are three steps after receivers make their click choices. First, depending on their choices and random assignment, receivers receive more information and write one sentence about the article. In the second step, receivers are exposed to the summaries they did not receive more information for, and write one sentence about them (as in the knowledge-recall experiment). In the third step, without previous announcement and without having any information available, receivers answer the knowledge questions about all articles. Therefore, in the click-knowledge-recall experiment, knowledge is based on recall, and it is elicited for all articles (both if the receiver clicked and did not click to read more about them).

*Outcomes of Interest.*—Receiver knowledge is measured as the number of correct answers to multiple-choice questions about four main components of each research article: its main empirical finding, the sample used, its analysis methodology, and its conclusions. These components capture the main elements of scientific papers, as described in Munch (2013) and Schimel (2012), excluding the introduction, due to its overlap with conclusions and its lower specificity to the research article.

In all receiver experiments, receivers were exposed to summaries, and potentially more information, about eight research articles and incentivized to correctly answer the same 32 questions (receiving \$0.10 per correct answer). We measure the following outcomes:

- Summary-based knowledge, measured after receivers have read only a summary.
- Click rate, an indicator for clicks to learn more after being exposed to a summary.
- Materials-based knowledge, measured after receivers have read one to two pages about the research (the same as the senders' materials).
- Overall knowledge, the weighted average of summary-based knowledge, for those only exposed to a summary, and materials-based knowledge, for those who received more information.

These measures capture the potential, countervailing effects of Clickbait- and Viral-incentives. Attention incentives could reduce summary-based knowledge, based on the effects discussed in Section IA.<sup>12</sup> Simultaneously, they could also increase click rates and the fraction of people with (higher) materials-based knowledge. Hence, Clickbait- and Viral-incentives could *increase* or *decrease* overall knowledge, depending on the relative strength of these effects.

<sup>12</sup>Separately, we coded whether the summary clearly identified the correct answer option in the knowledge questions of the 595 summaries, using a human research assistant and GPT (version 3.5). In Supplemental Appendix C.4, we describe this coding and provide descriptive statistics for how frequently summaries contained information that clearly identified the correct answer option in the knowledge questions. We observe similar effects of both Clickbait- and Viral-incentives on the likelihood that the correct answer is available in the summary, according to each source of coding (human and GPT) separately and combining the coding sources, including an analysis that only considers the cases with coding agreement (in 71 percent of the cases).

An important additional outcome to consider is what are the beliefs of the individuals who do not click and are only exposed to summaries. Summaries written with Clickbait- and Viral-incentives could not only contain less information, but the information provided could potentially mislead readers, rather than lead to random errors. For that reason, we first consider what *kinds* of mistakes receivers make when asked about the research sample, after being exposed to a summary. We code incorrect answer options that indicate a larger sample than the study actually used for all research articles. For articles on health (cancer, sleep, and vaccines), we also code incorrect answer options that indicate the study used a more representative sample, defined as being closer to a sample of adults in the United States, than it actually did. The questions asked, all answer options, and how they were coded (if applicable) are shown in Supplemental Appendix B.3.

*Beliefs Measurement.*—We next examine what kinds of impressions summaries written with Clickbait- and Viral-incentives, relative to Info-incentives, leave on readers in the beliefs and intentions experiment. We measure receivers' beliefs about the implications of the research for what doctors recommend, what they would recommend to their family and friends and their own behavior. The research articles studied five behaviors: using rocking beds to improve sleep, consuming a low GI diet to reduce insomnia, eating cruciferous vegetables to reduce the risk of cancer, taking vitamin A to reduce the risk of skin cancer, and vaccinating children with the MMR vaccine. The first four behaviors are based on research that provides first evidence of a relationship or impact, and are *not* official doctor recommendations, while the last one (vaccination) is.

The experiment consisted of two main parts. In the first part, receivers were exposed to eight summaries and wrote a one-sentence summary about them. In the second part, receivers answered two sets of five questions, presented in random order. For each of the five behaviors, they answered yes or no to “is it an official doctor recommendation?” and “would you encourage your family and friends to engage in the behavior?” They received \$1 if their answer to one randomly selected question regarding official doctor recommendations was correct. Receivers also answered the open-ended question “How does the information you read about these scientific studies concern you or affect you and your future behavior?” Two independent research assistants coded the answers as “no effect,” if the receiver stated it would not affect them, “increase interest,” if the receiver indicated they would like to learn more, and “behavior change,” if the receiver indicated they would change their diet or other behaviors. We build an intentions index (not preregistered), which considers these three measures (the average response to questions about doctor recommendations and encouragement, and an indicator for whether receivers indicated an intended behavior change themselves), using the approach in Anderson (2008).<sup>13</sup>

<sup>13</sup> At the end of the experiment, to fully inform receivers about the research, they were presented with the full materials about the research and they could click to access the research article. Receivers were also asked about their trust in scientists and media (“How much do you trust scientists?” and “How much do you trust science that you read about in news articles and on social media?”, with a scale 1 to 4 (from “Do not trust at all” to “Trust completely”) either before or after reading the materials. Trust was not different depending on the order ( $p$ -value  $> 0.05$  for trust in media and scientists; see Supplemental Appendix Table E.18).

Receivers were exposed to a subset of 120 sender messages. The same number of summaries was drawn from each treatment in the sender experiment. We used the knowledge of receivers, obtained in the knowledge experiment, to build two categories based on whether receivers scored above-median and below-median in the knowledge questions. These categories were an additional criterion used for the draw of the 120 summaries. Since we do not observe differences in receivers' beliefs depending on the knowledge categories, we pool the data to focus on differences in beliefs based on senders' incentives.<sup>14</sup>

*Additional Experiments.*—We conduct two additional experiments, measuring sharing beliefs and donation decisions, reported in detail in Supplemental Appendices E.5 and E.6.

Sharing is a form of online attention that increases the number of people who see a summary. We elicit receivers' sharing beliefs, by asking them which summary would be shared most frequently on social media, with and without incentives for accuracy. Receivers read summaries written with Clickbait-incentives and Info-incentives, or Viral-incentives and Info-incentives, as in the click experiments. The results show that summaries written with Viral-incentives are selected significantly more often as the ones that would be most shared on social media.

We elicited receivers' support for vaccination and climate causes in an additional experiment in which receivers made two donation decisions toward vaccine and climate conservation nonprofit organizations. The results indicate that summaries written with Clickbait-incentives and Viral-incentives directionally, but not statistically significant, increase donation rates.<sup>15</sup>

### C. Experimental Procedures

All receiver experiments were conducted on Prolific Academic. They were preregistered on aspredicted.org (details in Supplemental Appendix B.1). A total of 3,743 participants were exposed to summaries by professionals (1,043 in the knowledge, 905 in the knowledge-recall, 651 in the click-knowledge, 643 in the click-knowledge-recall, and 501 in the beliefs and intentions experiments).<sup>16</sup> Receivers earned a payment for participation equivalent to \$12 per hour, based on the expected length of each experiment (5–25 minutes). The approval rate required

<sup>14</sup> The summaries were selected according to the following criteria: Among summaries written under Clickbait- and Viral-incentives, half resulted in below-median knowledge and half resulted in above-median knowledge. They all received above-median clicks (for Clickbait-incentives) and above-median sharing belief (for Viral-incentives). Among summaries written with Info-incentives, all received above-median knowledge. Half of the summaries received below-median click rate and half received below-median sharing belief. We pool these groups in the main analyses, for comparability with other results and because differences between the groups are not observed ( $p$ -value > 0.05 in all comparisons), and provide detailed results in Supplemental Appendix E.3.

<sup>15</sup> With our sample of 299 participants, the increase in donations is 0.04–0.07 pp (SE 0.07) with a rate of giving between 26 and 33 percent for summaries written with Info-incentives.

<sup>16</sup> Recruitment occurred in two waves for the knowledge and click-knowledge experiments, and controls for wave of data collection are included throughout in the analyses. Additionally, 659 participants were exposed to summaries by GPT (360 in the knowledge experiment; 299 in the click experiment). There are 878 participants in the incentivized sharing experiments (611 exposed to professionals' summaries and 267 to GPT's summaries), 404 in the unincentivized sharing experiment (198 exposed to professionals' and 206 exposed to GPT's summaries), and 505 in the donation experiment, reported in the Supplemental Appendices E.5 and E.6.

was 95–100 percent in previous studies, and receivers were required to be located in the United States (checked via their IP address).

## II. Results of the Sender Experiment

This section shows the impact of senders' incentives on summary accuracy, focus, and writing style. It explores how summaries differ in two dimensions of content, sample information, and implications, and compares senders' writing to online writing about the research. It concludes by examining the summary writing by an LLM, rather than human senders. While the effects of Clickbait- and Viral-incentives do not differ significantly in the sender experiment among professionals, we report them separately—deviating from the preregistration—to be consistent in the presentation of results across all sender and receiver experiments.

*A. Accuracy.*—Summaries written with Info-incentives have a total of 5.5 units, on average. Within each summary, 4.3 units are accurate-in text, 0.35 units are inaccurate-in text, and 0.84 units are not in text. Figure 3 and Table 1 show that the accuracy index drops by 0.31 SD with Clickbait-incentives and 0.38 with Viral-incentives ( $q$ -value  $\leq 0.01$ ).

The number of accurate-in text units decreases by 0.61 units (or, equivalently, 11 percent of total units, and 0.35 SD) under Clickbait-incentives, and 0.82 units (14 percent or 0.47 SD) under Viral-incentives, as detailed in Supplemental Appendix Table C.1. This drop is matched with an increase in the number of not in text units (0.62 units for Clickbait-incentives, and 0.87 units for Viral-incentives), leaving the total number of units unchanged. At the same time, Clickbait- and Viral-incentives do not increase the number of inaccurate-in text units, which are rare (between 0.35 and 0.39 units).

*B. Focus.*—Summaries written with Info-incentives feature 1.5 units classified as introduction, 2.2 units as findings, and 1.4 units as conclusion. On average, only 0.4 units are classified as method, indicating that methodology receives little coverage in research summaries. Clickbait and Viral-incentives decrease the focus on research details (methods and findings), increasing the focus on motivating the research and drawing implications, as detailed in Supplemental Appendix Table C.2. The focus index drops by 0.31 and 0.45 SD, respectively (Table 1,  $q$ -value  $< 0.01$ ).

*C. Style.*—Clickbait and Viral-incentives lead to shorter and more readable summaries that have more exclamation and question marks. While the average summary is 102 words long under Info-incentives, it is 7.5 words shorter with Clickbait-incentives and 13.3 words shorter with Viral-incentives. The Flesch Reading Ease score under Info-incentives is 25.55, equivalent to a *college graduate level*—meaning it is very difficult to understand and suitable for university graduates. The score goes up by 6.7 and 9.8 points, respectively—the equivalent of going down one grade level (10 points), decreasing the reading difficulty to *college level*. The frequency of exclamation marks more than quadruples, increasing from 5 percent by 23 pp, and that of question marks more than doubles, from 7 percent by 14–16 pp with

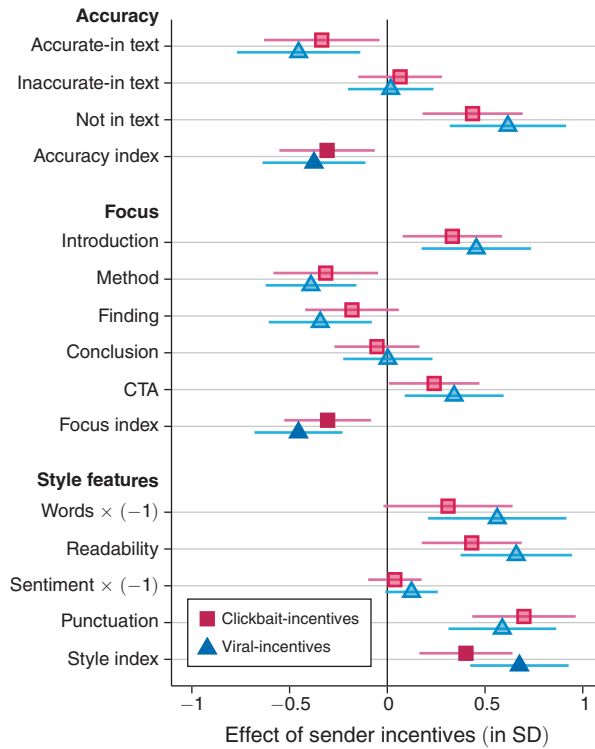


FIGURE 3. AVERAGE EFFECT OF SENDER INCENTIVES ON MESSAGE PRODUCTION

*Notes:* This figure shows the average treatment effect of Clickbait-incentives and Viral-incentives, relative to Info-incentives, on the three main outcomes, capturing senders' communication. The accuracy, focus, and style indices show the effects of the treatments on each index, constructed following Anderson (2008). The separate effects on each variable are shown separately (light-shaded icons). The accuracy variables (accurate-in text, Inaccurate-in text, not in text) and the focus variables (introduction, method, finding, conclusion, and CTA) are the number of units in each category in a message. All variables are standardized. Error bars correspond to 95 percent confidence intervals. Detailed results in Supplemental Appendix Tables C.1, C.2, and C.3.

Clickbait- and Viral-incentives (see Supplemental Appendix C.2 for more detail). Sentiment decreases with Viral-incentives too, by 0.12 SD—details on each outcome are in Supplemental Appendix Table C.3 and Section C.2. Reflecting these changes, the style index increases by 0.40 SD and 0.68 SD with Clickbait- and Viral-incentives, respectively (Table 1,  $q$ -value < 0.01).

The effects are summarized in Result 1.

*Result 1.*—Clickbait- and Viral-incentives lead to summaries that (i) contain a lower amount of accurate-in text information, and more not in text content; (ii) focus more on the motivation and less on the methodology of the research; and (iii) are shorter, easier to read, and with punctuation that exhorts attention, such as exclamation marks.

Taken together, the effects of Clickbait-incentives are consistent with senders creating information gaps by increasing their focus on introducing the research and providing less information about the research. The effects of Viral-incentives are qualitatively similar to those of Clickbait-incentives. Contrary to sharing motives

TABLE 1—INCENTIVE EFFECTS ON SENDER SUMMARIES

	Accuracy index (1)	Focus index (2)	Style index (3)
Clickbait-incentives	−0.308 (0.124) [0.010]	−0.305 (0.112) [0.008]	0.402 (0.121) [0.004]
Viral-incentives	−0.375 (0.133) [0.002]	−0.454 (0.114) [0.001]	0.676 (0.127) [0.001]
Constant	−0.378 (0.193)	0.584 (0.149)	−0.669 (0.173)
Observations	595	595	595

*Notes:* This table displays the estimated average marginal effects from linear regressions on the accuracy, focus, and style indices, constructed as in Anderson (2008). All regressions include fixed effects for each article and sender characteristics. Sharpened FDR  $q$ -values are computed using the Anderson (2008) two-stage BKY procedure, over all outcomes in the table for a treatment, and are shown in square brackets.

based on violating expectations, there is no more inaccuracy or an increase in conclusion units, rather more new content (not in text units). An open question is whether the new content could mislead receivers through *how* it describes the context and the broader importance of the research. We therefore conduct exploratory analyses that examine how the research is described.

#### A. *Effects of Incentives on How the Research is Described*

First, we examine sample information provided in summaries, which is quantifiable. Consistent with the drop in units describing the research methods, senders are less likely to report sample information with Clickbait- and Viral-incentives (39 percent and 34 percent, respectively) compared to Info-incentives (48 percent). If the sample is reported, under Viral-incentives but not Clickbait-incentives, senders used sample descriptions that were not precise more frequently, without reporting the exact group of individuals or specimens involved (Supplemental Appendix Table C.6,  $q$ -value = 0.03).<sup>17</sup> These patterns suggest that, if information is provided, more vagueness is present under Viral-incentives.

Second, we explore whether senders use language that increases the relevance of the research to readers. We consider two measures: whether the research directly appeals to the reader (e.g., “you will learn how to sleep better”), and whether the summary draws incorrect implications (e.g., the reader should change their diet to reduce insomnia, although the research caveats that the findings are, thus far, correlational). Both Clickbait- and Viral-incentives increase direct appeals to readers in summaries (by 17 pp and 26 pp, respectively, relative to a 0.15 mean under Info-incentives,  $q$ -value < 0.01, Supplemental Appendix Table C.6). Simultaneously,

<sup>17</sup>It is rare for the sample size or exact origin (e.g., group or specimens involved) to be reported incorrectly (1 percent to 6 percent of the cases). It is more frequent for the sample size and origin to be described in vague terms (8 percent to 38 percent).

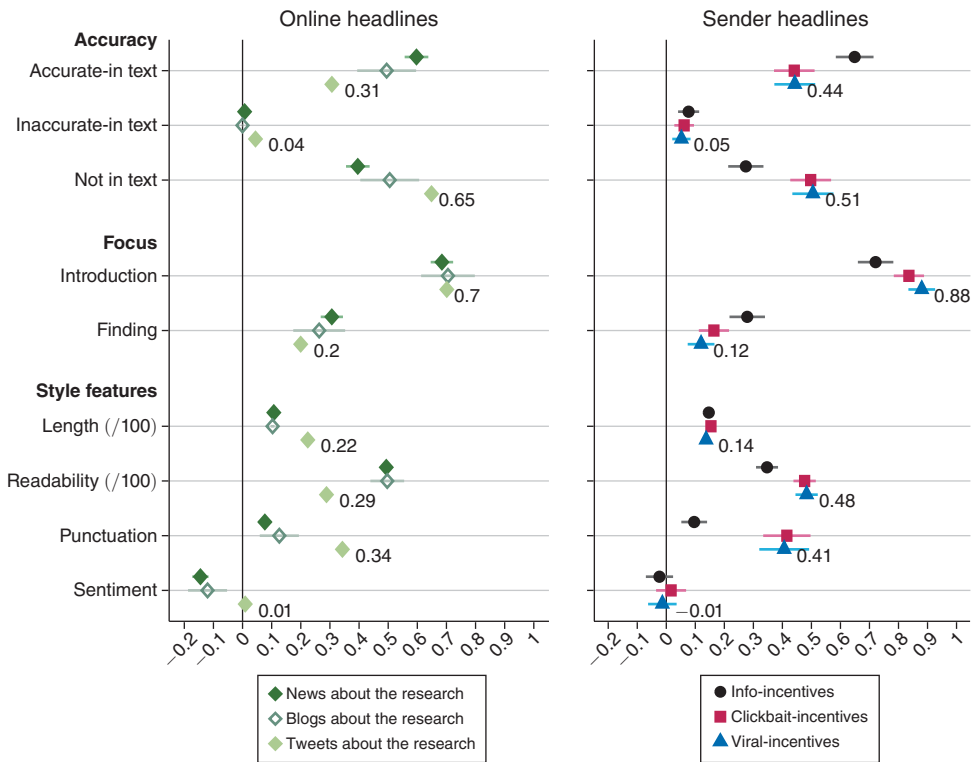


FIGURE 4. HEADLINE FEATURES OF SENDER SUMMARIES AND NATURALLY OCCURRING MENTIONS

Notes: This figure compares the headlines written in news, blogs and tweets about the research (left panel) with the headlines written by senders (right panel). The figure shows the fraction of headlines classified by accuracy (accurate-in text, inaccurate-in text, not in text) and focus (introduction and finding). The figure then shows the average values for features of writing style in headlines (or tweets). Words and readability scores are divided by 100 for comparability purposes. Error bars correspond to 95 percent confidence intervals. Details are shown in Supplemental Appendix Tables D.1 and D.2.

with Viral-incentives, there is a marginally significant increase in the likelihood of incorrect implications (by 12 pp, relative to a 0.29 mean under Info-incentives,  $q$ -value = 0.054, Supplemental Appendix Table C.6), which could mislead readers regarding the relevance of the research for them.

These findings suggest that, in addition to the reduction in the amount of detailed information about the research with Clickbait- and Viral-incentives, the likelihood that summaries contain content that could mislead readers is higher.

### B. Naturally Occurring Attention to the Research Articles

Next, we examine whether the content written by senders in the sender experiment is similar to that appearing online in news, blogs and Twitter (details in Supplemental Appendix D). Figure 4 reveals strong similarities in accuracy and focus between headlines written in the sender experiment and those appearing online. Headlines written with Clickbait- and Viral-incentives feature accurate-in text content 44 percent of the time, which is between the percentage found in tweets (31 percent) and

online blogs (50 percent) and less than that found in news (60 percent). In both settings, the remainder of content is mainly classified as not in text. Headlines rarely feature inaccurate-in text content (at most, 4 percent of the time for tweets).

In terms of focus, a majority of headlines focus on introducing the research, over 70 percent of the time. The rate of such units is between 84 percent and 88 percent with Clickbait- and Viral-incentives, compared to 68 percent for news, 70 percent for tweets, and 71 percent for blogs.

In terms of writing style, the average length of headlines written by senders is in between the length of headlines in news and blogs (11 words) and that of tweets (22 words). The readability of headlines in the Clickbait- and Viral-incentives treatments (a score of 48) is similar to that in news (49) and blogs (50). The sentiment of senders' headlines (between  $-0.02$  and  $0.02$ ) is similar to that of tweets, which is neutral (0 sentiment score) and somewhat more positive than the sentiment of news and blogs headlines ( $-0.15$  and  $-0.12$  sentiment score). Further, the use of punctuation under Clickbait- and Viral-incentives is similar to that observed in tweets.

Taken together, although the incentives of online content producers are heterogeneous and unknown, the findings indicate that the distribution of features of senders' summaries in the sender experiment is consistent with those found online.

### C. LLM as Sender

The LLM reveals qualitatively similar results to our experiment with professionals. The effects of incentives (instructions) on content creation by the LLM are summarized in Figure 5. Additional regression analyses are shown in Supplemental Appendix F.1.

A main difference between professionals and the LLM is that the LLM is significantly more likely to only use the materials it was provided. This increases the accuracy of summaries created by the LLM in all treatments. Under Info-incentives, summaries contain almost only accurate-in text information: 5.2 out of 5.4 units are accurate-in text. On average, only 0.15 units are inaccurate-in text, and 0.1 units are not in text (compared to 0.4 and 0.8 with professionals).

For the LLM, Viral-incentives lead to the strongest changes in accuracy, focus, and style. With regards to accuracy, Clickbait- and Viral-incentives reduce the number of accurate-in text units. However, the LLM does not substitute them with more Not in text units, like professionals did. Clickbait- and Viral-incentives increase the number of introduction units and decrease methods and findings units, as they did for professionals.<sup>18</sup> Likewise, summaries become shorter and more readable, and with Viral-incentives, with more punctuation that aims to attract attention.

Overall, the effects of instructing the LLM to create content that grabs attention are qualitatively similar to those observed for professionals. However, they are smaller in magnitude, which can be explained by the fact that the LLM produces summaries that more closely follow the materials than professionals.

<sup>18</sup> Since the LLM does not include any units that are CTAs, there are no effects for them.

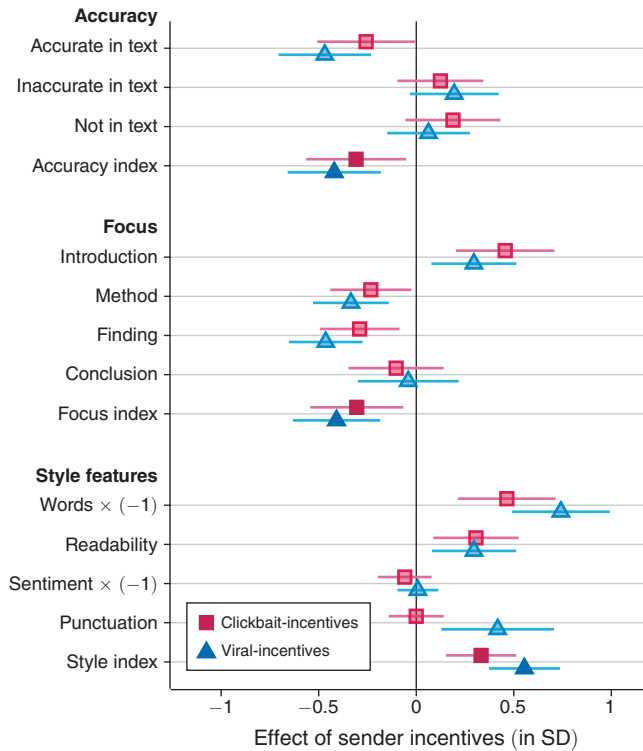


FIGURE 5. AVERAGE EFFECTS ON MESSAGE PRODUCTION: LLM AS SENDER

Notes: This figure shows the average treatment effect of Clickbait-incentives and Viral-incentives, relative to Info-incentives, on message production by the LLM (GPT). Error bars correspond to 95 percent confidence intervals. Observations = 360 summaries.

### III. Results of the Receiver Experiments

#### A. Knowledge and Clicks

We next examine the impact of senders' incentives in the sender experiment on the knowledge of receivers. We consider the four main outcome variables described in Section IB: the knowledge of receivers when exposed to the summaries only, their click rates, knowledge when exposed to detailed research information, and the resulting overall knowledge.

*Summary-Based Knowledge.*—Summaries created with Clickbait- and Viral-incentives result in lower knowledge among receivers. Table 2, column 1, shows that when the summaries are available, the decrease in knowledge is of 5.5 to 6.8 pp, respectively. And, panel A of Figure 6 shows that knowledge with Info-incentives stochastically dominates that with Clickbait- and Viral-incentives.

Panel B of Figure 6 shows the largest drop is in knowledge about the study sample. Receivers correctly answer questions about the study sample in 38 percent of the cases when exposed to summaries written with Clickbait- and Viral-incentives,

TABLE 2—KNOWLEDGE AND CLICKS: SUMMARY-LEVEL RESULTS

	Summary-based knowledge			Materials-based knowledge		Overall knowledge	
	Avail. (1)	Recall (2)	Click rate (3)	Avail. (4)	Recall (5)	Avail. (6)	Recall (7)
Clickbait-incentives	−0.055 (0.013) [0.001]	−0.028 (0.015) [0.078]	0.050 (0.012) [0.001]	0.013 (0.023) [0.197]	−0.030 (0.025) [0.112]	−0.028 (0.013) [0.063]	−0.024 (0.013) [0.078]
Viral-incentives	−0.068 (0.013) [0.001]	−0.021 (0.015) [0.075]	0.041 (0.012) [0.002]	−0.043 (0.026) [0.071]	−0.042 (0.025) [0.071]	−0.062 (0.013) [0.001]	−0.025 (0.012) [0.040]
Constant	0.374 (0.018)	0.330 (0.022)	0.350 (0.020)	0.785 (0.029)	0.565 (0.034)	0.507 (0.019)	0.417 (0.020)
Observations	595	589	595	395	451	595	595
Info-incentives: mean	0.57	0.49	0.20	0.82	0.64	0.62	0.53
Info-incentives: SD	0.18	0.17	0.12	0.19	0.21	0.15	0.14

*Notes:* This table displays the estimated coefficients from linear regressions on (i) summary-based knowledge when the summary is available (knowledge experiment) and when it must be recalled and the preferred click choices of the receiver are implemented (knowledge-recall and click-knowledge-recall experiment, for summaries not clicked on, which due to random implementation results in *observations* = 589 being observed by receivers in this group) (columns 1 and 2); (ii) click rate (column 3); (iii) materials-based knowledge (for those whose preferred click choices were implemented), when the materials were seen by the receiver (click-knowledge experiment) and when they had to be recalled (click-knowledge-recall experiment) (columns 4 and 5)—note that, since ca. 6 percent of summaries were never clicked on and ca. 25 percent of click choices were not implemented, by design, the number of observations in columns 4 and 5 is lower; and (iv) overall knowledge (columns 6 and 7). Regressions include article fixed effects and sender characteristics. Sharpened FDR  $q$ -values are computed using the Anderson (2008) two-stage BKY procedure, over all outcomes in the table for a treatment, and shown in square brackets.

compared to 51 percent with Info-incentives. With Clickbait-incentives, knowledge about the findings, the methods, and the conclusion of the research decreases to a lesser extent: 3–4 pp. With Viral-incentives, knowledge decreases more for questions about the findings and methods, by 6 and 7 pp, respectively, and shows a smaller drop for questions about the conclusion (2 pp; see Supplemental Appendix Table E.8 for details).

When summaries must be recalled, knowledge drops across all conditions and the impact of senders' incentives is reduced, as shown in column 2 of Table 2.<sup>19</sup> Panel B of Figure 6 shows that the drop in knowledge about the sample and method becomes smaller when summaries must be recalled. These reduced drops suggest that receivers pay less attention to these dimensions of the research and that senders with Clickbait- and Viral-incentives focus their summaries on dimensions that receivers are most likely to recall.

The differences in receiver knowledge closely correspond to the effects of senders' incentives on the accuracy and focus of summaries documented in Section II. An important part of this correspondence stems from the summary information: If the summary contains a clear answer to a knowledge question, receivers' likelihood of answering it correctly strongly increases. At the same time, exploratory analyses show

<sup>19</sup>To analyze summary-based knowledge with recall, we pool receivers' knowledge in the knowledge-recall experiment and in the click-knowledge-recall experiment when answering questions about articles they did not click to read more about (four subjects are dropped because they clicked to read all articles), because there is no significant difference in accuracy, as shown in Supplemental Appendix Table E.7.

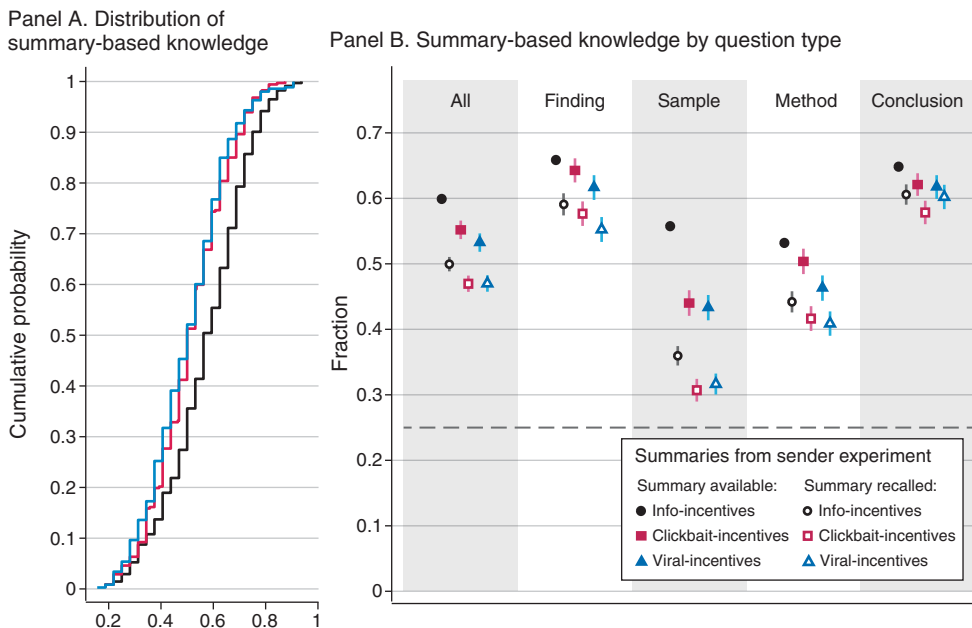


FIGURE 6. RECEIVER KNOWLEDGE WHEN EXPOSED TO SUMMARIES

Notes: Panel A (left) shows the distribution of summary-based knowledge (fraction of correct answers after reading summaries) when receivers had the summaries available (knowledge experiment). Panel B (right) shows summary-based knowledge by question type. The filled markers indicate “Summary available” for receivers who saw the summary while answering the questions. The empty markers indicate “Summary recalled” for receivers who had to answer questions based on recall. Within panel B, there are four subpanels: “All” panel (left-most), for the average over all questions, followed by the average knowledge for finding, sample, methods, and conclusion questions separately. Estimates from responses at the *question* level based on  $observations = 2,588$  receivers. Regression estimates shown in Supplemental Appendix Tables E.5 and E.6, column 1, for all questions, and Supplemental Appendix Tables E.8 and E.9, column 1, by question type. Error bars correspond to 95 percent confidence intervals.

that information in the summaries is not the only feature that matters. If summaries are available, a higher style index lowers the likelihood that a receiver answers the question correctly, as we report in Supplemental Appendix Table E.5, column 4.

*Click Rate.*—Summaries written with Info-incentives are clicked on 20 percent of the time. Table 2 column 3 shows that click rates increase by 5 pp and 4 pp ( $q$ -value  $< 0.01$  in both cases) for summaries written with Clickbait- and Viral-incentives, respectively. These results are obtained when comparing click rates at the message level, and also when examining receivers’ individual-level choices. The increased click rate toward summaries written with Clickbait-incentives is observed in both the click-knowledge and click-knowledge-recall experiments (5 pp in both cases). As shown in Supplemental Appendix Table E.10, the increased click rate on summaries written with Viral-incentives is not observed in the click-knowledge experiment, but it is observed in the click-knowledge-recall experiment, suggesting that the differences in click rates between viral and Info-incentives may be less robust.

*Materials-Based Knowledge.*—When receivers click to learn more about the research, they are all exposed to the same (detailed) information that senders read. In all treatments, their knowledge increases. The percentage of correct responses is

79–85 percent when the materials are available and 57–60 percent when the materials must be recalled (for detail, see Supplemental Appendix Tables E.12 and E.13 and Supplemental Appendix Figure E.1).

Columns 4 and 5 of Table 2 show that sender incentives do not affect materials-based knowledge, when summaries are written with Clickbait-incentives. By contrast, there is a 4 pp marginally significant decrease when they are written with Viral-incentives, suggesting that receivers' materials-based knowledge was still weakly affected by what they read in the summaries.

*Overall Knowledge.*—When receivers answer knowledge questions having (summaries or materials) information available, overall knowledge exhibits a marginally significant drop with Clickbait-incentives ( $q$ -value = 0.063) and a significant drop with Viral-incentives, by 6 pp ( $q$ -value < 0.01). When receivers must recall what they learned about the research, the knowledge losses are smaller. Overall knowledge exhibits a marginally significant drop of 2.4 pp ( $q$ -value = 0.078) with Clickbait-incentives, and a significant drop of 2.5 pp ( $q$ -value = 0.040) with Viral-incentives.

These findings imply that the loss in knowledge when receivers are exposed to summaries written with Clickbait- and Viral-incentives can be compensated by an increase in clicks, resulting in small changes in overall knowledge—an illustration of the attention-information trade-off.

*Result 2.*—Receiver knowledge decreases with Clickbait- and Viral-incentives, when they are asked about the research and have the summaries available. If summaries must be recalled, the effect of senders' incentives is smaller and knowledge does not drop significantly. Simultaneously, summaries written with Clickbait- and Viral-incentives attract significantly more attention. Hence, accounting for clicks, overall knowledge losses with Clickbait- and Viral-incentives are small in magnitude.

### B. Impressions: Receivers' Errors, Beliefs, and Intentions

While Clickbait- and Viral-incentives do not lead to large losses in knowledge on average, a large majority of receivers (75–80 percent) do *not* click and are only exposed to summaries. The evidence in Section II shows that these summaries contain significantly less information about the research. An open question is whether the summaries induce receivers to hold beliefs about the research that are systematically incorrect. In this section, we examine two types of beliefs about the research: beliefs about the sample involved in the research, measured by the size and representativeness of the sample, and beliefs about the relevance of the research to receivers' behavior outside the experiment.

*Receiver Errors about the Sample.*—Since senders provided less information about the sample, receivers could form noisy beliefs about it or, alternatively, because of how summaries are written and their new (not in text) content, they could form biased beliefs about it. We examine whether receivers were more likely to believe that the sample was larger or more representative of a US citizen than the one used in the study. Figure 7 shows that receivers are not more likely to believe

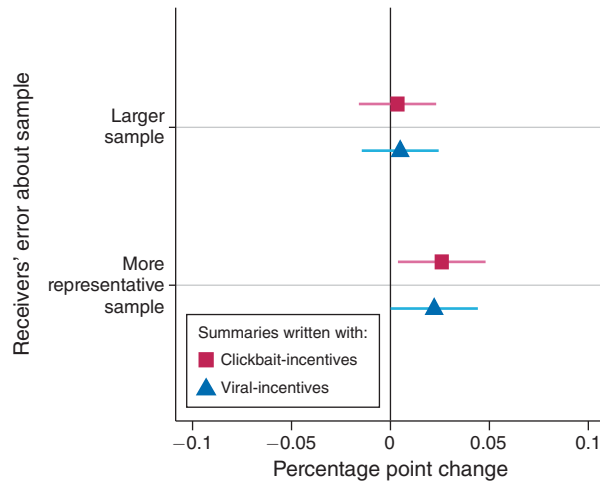


FIGURE 7. RECEIVER ERRORS

*Notes:* This figure displays the estimated coefficients from linear regressions on the likelihood that receivers incorrectly answer the question about the sample of a research article, selecting one that states a larger sample than the one used (“Larger sample”) or one that states a group being studied that is closer to a more representative group, defined as closer to a US citizen (“More representative sample”). The regression includes receivers from the knowledge and knowledge-recall experiments who incorrectly answered the questions about the study sample. Robust standard errors clustered at the receiver level are used. A detailed description for how each answer option is coded is provided in Supplemental Appendix B.2. Error bars correspond to 95 percent confidence intervals. Details shown in Supplemental Appendix Tables E.2 and E.3.

that the sample was larger. But, when exposed to summaries written with Clickbait- and Viral-incentives, they are more likely to believe that it is representative of a US citizen than it actually is. The effects are of limited magnitude, though, (3 pp) suggesting potential small biases in receivers’ impressions about the similarity of the research sample to the reader.<sup>20</sup>

*Beliefs and Intentions.*—We examine whether receivers formed different beliefs about the implications of the research depending on senders’ incentives when writing the summaries they were exposed to in the beliefs and intentions experiment. While the studies on sleep and cancer are based on first evidence that showed changes that *might* help, the studies on MMR vaccines further confirm the already known protective properties of the vaccine and the lack of evidence of harm (specifically, autism risk).

Figure 8 shows the average impact of being exposed to summaries written with Clickbait- and Viral-incentives, compared to Info-incentives, on encouragement of others, intended own behaviors and beliefs about doctor recommendations, and the

<sup>20</sup>Detailed regression results are provided in Supplemental Appendix E. A related question is whether mistaken beliefs are more likely to arise when no information is presented at all, or rather when some sample information is included, but it is vague. As shown in Supplemental Appendix Table E.4, when receivers are exposed to imprecise sample information in summaries written with Clickbait- and Viral-incentives, they are significantly more likely to hold biased beliefs about the representativeness of the sample. This analysis suggests that a complete lack of information may lead to random errors. But, when some information is provided under incentives to grab attention, this partial information may lead receivers to believe a more representative sample participated in the research than it actually did.

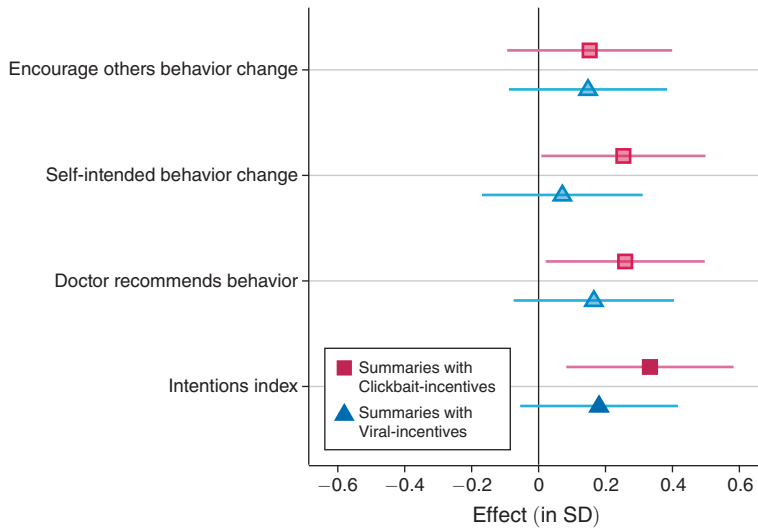


FIGURE 8. RECEIVER BELIEFS AND INTENTIONS

*Notes:* This figure displays the estimated coefficients from linear regressions on the effect of summaries written with Clickbait- and Viral-incentives on questions about encouraging others, their own behavior, and doctors' official recommendations. All outcomes are standardized. Encouraging others and doctor recommendations involved five behaviors: rocking to improve sleep, consuming a low GI diet to reduce insomnia, eating vegetables to reduce the risk of cancer, taking Vitamin A to reduce the risk of skin cancer, and giving their children the MMR vaccine. Self-intended change is an indicator variable that takes value 1 if receivers indicated the summaries increased their likelihood to change behavior in an open-text response to a question asking about their effects of the summaries. The intentions index aggregates follow Anderson (2008), computed over the sum of behaviors receivers would encourage others to take and believe are doctor recommendations. Detailed regression results are shown in Supplemental Appendix Table E.14.

intentions index. Summaries written with Clickbait-incentives lead to a significant increase in the index ( $q$ -value  $< 0.01$ ). They also lead to a marginally significant increase in the individual outcomes ( $q$ -value = 0.07 for beliefs about doctor recommendations and own behaviors, and  $q$ -value = 0.08 for encouragement of others). Summaries written with Viral-incentives do not have a statistically significant impact on these outcomes, but are directionally similar (see Supplemental Appendix Table E.14).

The data show that receivers are generally aware that the MMR vaccine is officially recommended and correctly indicate so in 96 percent of the cases. However, they hold incorrect beliefs about doctor's official recommendations to improve sleep or reduce cancer risk. Under Info-incentives, between 50 percent and 72 percent of receivers indicate changes in diets and rocking as officially recommended. These fractions increase directionally when summaries are written with Clickbait- and Viral-incentives, as detailed in Supplemental Appendix Table E.16.<sup>21</sup>

<sup>21</sup>To better understand what drives encouragement of others, we explore which summary features predict encouragement. Summaries that contain incorrect implications, as described in Section IIA, increase the likelihood that the receiver intends to encourage behavior changes in others, providing suggestive evidence that implications drawn in summaries could affect behavior (see Supplemental Appendix Table E.17). We also examine whether receivers' trust in media and scientists changes. When exposed to summaries written with Viral-incentives, relative to Info-incentives summaries, their trust does not change. There is a marginally significant increase in trust in

*Result 3.*—Exposure to summaries created under Clickbait- and Viral-incentives increases the fraction of receivers who believe the sample used in the research is representative of the US population, and for Clickbait-incentives, this exposure increases the likelihood that intended behaviors and beliefs change. Specifically, behaviors suggested as beneficial in the summaries are more likely to be perceived as official doctor recommendations and affect behavioral intentions, at a marginally significant level.

While receivers may infer the wrong implications from the initial evidence they see for cancer and sleep, it is important to highlight that these behaviors are health-improving behaviors. For ethical reasons, we did not expose receivers to research that could reduce willingness to vaccinate or increase the intake of harmful substances. However, recent evidence by Allen, Watts, and Rand (2024) shows that exposure to content on Facebook that discourages vaccination, but is not flagged as false, has significant negative impacts on vaccination intentions, consistent with the effects we document in the beliefs and intentions experiment.

### C. *Heterogeneity in Click Rates and Knowledge*

The analysis thus far has focused on the average effect of summaries written with Clickbait- and Viral-incentives on receiver knowledge and attention. The findings suggest that, while they contain less information, summaries also attract more attention when they are written with the incentive to generate clicks and shares. In this section, we examine the heterogeneity in the relationship between click rates and knowledge. We focus on heterogeneity at the summary level, rather than the sender level, because individual-level sender effects explain limited variation (2–15 percent) in knowledge, clicks, and the combination of both.<sup>22</sup>

Figure 9 shows the relationship between click rates and summary-based knowledge (panel A) or overall knowledge (panel B). Consistent with summaries creating information gaps, as in Golman and Loewenstein (2018), panel A shows that a 1 pp increase in click rates is associated with an average 0.3 pp decrease in summary-based knowledge. Panel B shows that, once we account for the knowledge that receivers gain after clicking, the negative relationship between click rates and knowledge disappears. The gain in knowledge among those who click offsets the knowledge losses among those who only read the summary.<sup>23</sup>

Figure 9 reveals significant heterogeneity in click rates and knowledge. For example, the top quartile of summaries achieve a click rate of more than 31 percent, while 6 percent are never clicked on. In Supplemental Appendix E.4 (Table E.20), we examine which, if any, features of summaries are predictive of click rates and knowledge. Summaries with a higher accuracy index are associated with more

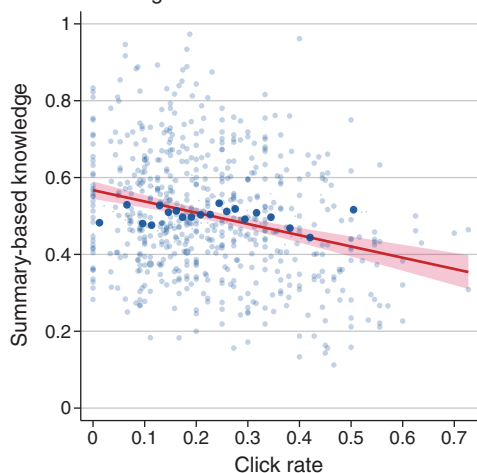
---

the media when receivers are exposed to summaries written with Clickbait-incentives, as shown in Supplemental Appendix Table E.18.

<sup>22</sup>The fraction of explained variance is calculated with the intraclass correlation coefficient, based on a random effects panel regression, where senders are the individuals. A small fraction of the variance in clicks is explained by sender differences (2 percent). A higher fraction of the variance in knowledge and the likelihood that both knowledge and clicks are above median is explained by sender differences (5–15 percent).

<sup>23</sup>Supplemental Appendix Table E.19 shows detailed regressions with further controls to examine the relationship between clicks and summary-based knowledge. This relationship does not change significantly depending on whether the receiver must recall the summary.

Panel A. Click rate and summary-based knowledge



Panel B. Click rate and overall knowledge

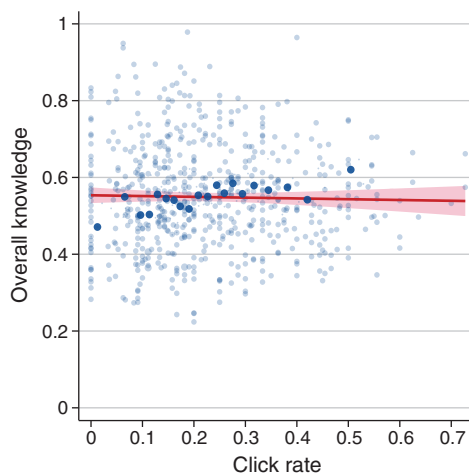


FIGURE 9. HETEROGENEITY IN RECEIVERS' ATTENTION AND KNOWLEDGE

Notes: Panel A shows the average click rate on each message ( $x$ -axis) and summary-based knowledge ( $y$ -axis) pooling all sender incentive treatments. Panel B shows the average click rate ( $x$ -axis) and the overall receiver knowledge ( $y$ -axis). In the background, each light-colored dot is weighted by the number of observations (summaries) with the same values. Each dark-colored dot represents a demidecile of the distribution. A fitted linear regression between the two variables is shown in each panel, with 95 percent confidence intervals. Detailed regression analyses and separate figures are provided in Supplemental Appendix Table E.19 and Supplemental Appendix Figure E.2.

knowledge among receivers, but fewer clicks. Considering clicks and knowledge together, we find that it is difficult to predict above-median knowledge and clicks (regressions achieve an  $R^2$  of 0.09), a common finding in related work (e.g., Bakshy et al. 2011).

#### IV. Conclusion

Incentives to attract online attention, in the form of clicks and sharing, can have important impacts on information transmission. This paper combines several experiments to provide evidence on the impact of incentives to attract attention on the content that is generated, and the subsequent knowledge and attention allocation of readers in the context of science communication. The findings reveal that incentives to attract attention generate a trade-off: The content contains less information, but it is more attention grabbing. Since these incentives generate information demand, making interested readers better informed, we find small impacts of attention incentives on receivers' knowledge about the research, on average.

However, there is a large share of receivers who do not demand more information and are left only with the information that is provided in short summaries. We find that these summaries can lead to misperceptions. While attention incentives do not increase the amount of content that is factually incorrect, they lead senders to introduce new content that attempts to increase the perceived relevance of the findings for the reader. Readers are more likely to mistakenly believe the study sample is representative of the US population and exhibit bias toward believing that the

behaviors studied by the research are prescriptive and motivating to change behavior, although the research findings are suggestive and too preliminary to generate clear behavioral implications.

Taken together, these findings suggest that, when communicating information about science, a new channel can lead misperceptions to arise: Incorrect beliefs may be generated through vague information that lacks detail, combined with content focused on the relevance of the topic, rather than through explicitly inaccurate information about what scientists did and found.

It is important to highlight that this study sheds light on the impact of incentives to grab attention when professionals are hired to write about scientific articles, without reputational concerns. More research is needed to investigate whether adding reputational incentives could result in different impacts, not only on how research is described, but also which research topics are chosen to be broadcasted. Further, the current study focuses on the first stage of communication, from a highly informed sender to a receiver, who could potentially share some of the content with others, creating further distortions in information transmission (e.g., Carlson 2018; Graeber, Noy, and Roth 2024). Documenting the impact of different incentives and studying the intensive and extensive margins of communication will be important to provide further insights into how attention and information transmission interact.

This paper focuses on science communication, but political communication is another setting of relevance. Some content producers (news outlets, politicians, and others) could have strong incentives to maximize their clicks and shares when they face intense competition (e.g., Djourelouva, Durante, and Martin 2025) and it is an open question whether incentives to grab attention can play a role in the polarization of content (e.g., Levy 2021).

## REFERENCES

- Abeler, Johannes, Daniele Nosenzo, and Collin Raymond. 2019. "Preferences for Truth-Telling." *Econometrica* 87 (4): 1115–53.
- Abeler, Johannes, David Huffman, and Collin Raymond. 2023. "Incentive Complexity, Bounded Rationality and Effort Provision." IZA Discussion Paper 16284.
- Acemoglu, Daron, Asuman Ozdaglar, and James Siderius. 2024. "A Model of Online Misinformation." *Review of Economic Studies* 91 (6): 3117–50.
- Allen, Jennifer, Duncan J. Watts, and David G. Rand. 2024. "Quantifying the Impact of Misinformation and Vaccine-Skeptical Content on Facebook." *Science* 384 (6699): eadk3451.
- Allcott, Hunt, Matthew Gentzkow, and Lena Song. 2022. "Digital Addiction." *American Economic Review* 112 (7): 2424–63.
- Altay, Sacha, Emma De Araujo, and Hugo Mercier. 2022. "“If This Account is True, it is Most Enormously Wonderful”: Interestingness-if-True and the Sharing of True and False News." *Digital Journalism* 10 (3): 373–94.
- Anderson, Michael L. 2008. "Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects." *Journal of the American Statistical Association* 103 (484): 1481–95.
- Bakshy, Eytan, Jake M. Hofman, Winter Mason, and Duncan J. Watts. 2011. "Everyone's An Influencer: Quantifying Influence on Twitter." In *Proceedings of the Fourth ACM International Conference on Web Search and Data Mining*, 65–74.
- Banerjee, Akshina, and Oleg Urminsky. 2025. "The Language That Drives Engagement: A Systematic Large-scale Analysis of Headline Experiments." *Marketing Science* 44 (3): 566–92.
- Barasch, Alixandra, and Jonah Berger. 2014. "Broadcasting and Narrowcasting: How Audience Size Affects What People Share." *Journal of Marketing Research* 51 (3): 286–99.
- Benjamini, Yoav, Abba M. Krieger, and Daniel Yekutieli, Daniel. 2006. "Adaptive Linear Step-up Procedures that Control the False Discovery Rate." *Biometrika* 93 (3): 491–507.

- Berger, Jonah, and Katherine L. Milkman.** 2012. "What Makes Online Content Viral?" *Journal of Marketing Research* 49 (2): 192–205.
- Berzaghi, Fabio, Marcos Longo, Philippe Ciais, Stephen Blake, François Bretagnolle, Simone Vieira, Marcos Scaranello, Giuseppe Scarasia-Mugnozza, and Christopher E. Doughty.** 2019. "Carbon Stocks in Central African Forests Enhanced by Elephant Disturbance." *Nature Geoscience* 12 (9): 725–29.
- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer.** 2016. "Competition for Attention." *Review of Economic Studies* 83 (2): 481–513.
- Bordalo, Pedro, Nicola Gennaioli, and Andrei Shleifer.** 2022. "Salience." *Annual Review of Economics* 14: 521–44.
- Brady, William J., Julian A. Wills, John T. Jost, Joshua A. Tucker, and Jay. J. Van Bavel.** 2017. "Emotion Shapes the Diffusion of Moralized Content in Social Networks." *Proceedings of the National Academy of Sciences* 114 (28): 7313–18.
- Braghieri, Luca.** 2024. "Political Correctness, Social Image, and Information Transmission." *American Economic Review* 114 (12): 3877–3904.
- Carlson, Taylor N.** 2018. "Modeling Political Information Transmission as a Game of Telephone." *Journal of Politics* 80 (1): 348–52.
- Chen, Heng, and Wing Suen.** 2023. "Competition for Attention and News Quality." *American Economic Journal: Microeconomics* 15 (3): 1–32.
- Chou, Wen-Ying Sylvia, April Oh, and William M.P. Klein.** 2018. "Addressing Health-Related Misinformation on Social Media." *JAMA* 320 (23): 2417–18.
- Clark, Roy Peter.** 2008. *Writing Tools: 55 Essential Strategies for Every Writer (10th Anniversary Edition)*. Little, Brown and Company.
- Crawford, Vincent P., and Joel Sobel.** 1982. "Strategic Information Transmission." *Econometrica* 50 (6): 1431–49.
- Caplin, Andrew, Mark Dean, and Daniel Martin.** 2011. "Search and Satisficing." *American Economic Review* 101 (7): 2899–2922.
- Dean, Mark, and Nathaniel Neligh.** 2023. "Experimental Tests of Rational Inattention." *Journal of Political Economy* 131 (12): 3415–61.
- Deversi, Marvin, Alessandro Ispano, and Peter Schwardmann.** 2021. "Spin Doctors: An Experiment on Vague Disclosure." *European Economic Review* 139: 103872.
- Djourelouva, Milean, Ruben Durante, and Gregory J. Martin.** 2025. "The Impact of Online Competition on Local Newspapers: Evidence from the Introduction of Craigslist." *Review of Economic Studies* 92 (3): 1738–72.
- Esponda, Ignacio, Ryan Oprea, and Sevgi Yuksel.** 2023. "Seeing What Is Representative." *Quarterly Journal of Economics* 138 (4): 2607–57.
- Flesch, R.** 1948. "A New Readability Yardstick." *Journal of Applied Psychology* 32 (3): 221–33.
- Galperti, Simone, and Isabel Trevino.** 2020. "Coordination Motives and Competition for Attention in Information Markets." *Journal of Economic Theory* 188: 105039.
- Gangwisch, James E., Lauren Hale, Marie-Pierre St-Onge, Lydia Choi, Erin S. LeBlanc, Dolores Malaspina, Mark G. Opler, Aladdin H. Shadyab, James M. Shikany, Linda Snetelaar, Oleg Zaslavsky, and Dorothy Lane.** 2020. "High Glycemic Index and Glycemic Load Diets as Risk Factors for Insomnia: Analyses from the Women's Health Initiative." *American Journal of Clinical Nutrition* 111 (2): 429–39.
- Gentzkow, Matthew, and Jesse M. Shapiro.** 2008. "Competition and Truth in the Market for News." *Journal of Economic Perspectives* 22 (2): 133–54.
- Golman, Russell, and George Loewenstein.** 2018. "Information Gaps: A Theory of Preferences Regarding the Presence and Absence of Information." *Decision* 5 (3): 143–64.
- Golman, Russell, George Loewenstein, Andras Molnar, and Silvia Saccardo.** 2022. "The Demand For, and Avoidance Of, Information." *Management Science* 68 (9): 6454–76.
- Graeber, Thomas, Shakked Noy, and Christopher Roth.** 2024. "Lost in Transmission." Unpublished.
- Graeber, Thomas, Reshmaan Hussam, Kailash Pandey, Abu Shonchoy and Chikako Yamauchi.** 2024. "Translating Information Into Action." [https://thomasgraeber.com/assets/papers/Graeberetal\\_TranslatingInfoIntoAction.pdf](https://thomasgraeber.com/assets/papers/Graeberetal_TranslatingInfoIntoAction.pdf).
- Graeber, Thomas, Florian Zimmermann, and Christopher Roth.** 2024. "Stories, Statistics, and Memory." *Quarterly Journal of Economics* 139 (4): 2181–2225.
- Guan, Menglong, Ryan Oprea, and Sevgi Yuksel.** 2023. "Too Much Information." Unpublished.
- Hebb, D. O.** 1949. *The Organization of Behavior: A Neuropsychological Theory*. Psychology Press.
- Hviid, Anders, Jørgen Vinsløv Hansen, Morten Frisch, and Mads Melbye, M.** 2019. "Measles, Mumps, Rubella Vaccination and Autism: A Nationwide Cohort Study." *Annals of Internal Medicine* 170 (8): 513–20.

- Jin, Ginger Zhe, Michael Luca, and Daniel Martin.** 2021. "Is No News (Perceived As) Bad News? An Experimental Investigation of Information Disclosure." *American Economic Journal: Microeconomics* 13 (2): 141–73.
- Kahneman, Daniel.** 1973. *Attention and Effort*. Prentice-Hall.
- Kang, Min Jeong, Ming Hsu, Ian M. Krajbich, George Loewenstein, Samuel M. McClure, Joseph Tao-yi Wang, and Colin F. Camerer.** 2009. "The Wick in the Candle of Learning: Epistemic Curiosity Activates Reward Circuitry and Enhances Memory." *Psychological Science* 20 (8): 963–73.
- Kim, Jongwoo, Min Kyung Park, Wen-Qing Li, Abrar A. Qureshi, and Eunyoung Cho.** 2019. "Association of Vitamin A Intake with Cutaneous Squamous Cell Carcinoma Risk in the United States." *JAMA Dermatology* 155 (11): 1260–68.
- Krajbich, Ian, Carrie Armel, and Antonio Rangel.** 2010. "Visual Fixations and the Computation and Comparison of Value in Simple Choice." *Nature Neuroscience* 13 (10): 1292–98.
- Lee, Yu-Ru, Ming Chen, Jonathan D. Lee, Jinfang Zhang, Shu-Yu Lin, Tian-Min Fu, Hao Chen, et al.** 2019. "Reactivation of PTEN Tumor Suppressor for Cancer Treatment through Inhibition of a MYC-WWPI Inhibitory Pathway." *Science* 364 (6441): eaau0159.
- Levy, Ro'ee.** 2021. "Social Media, News Consumption, and Polarization: Evidence from a Field Experiment." *American Economic Review* 111 (3): 831–70.
- LinkedIn.** 2023. "What is the optimal length of a social media post?" <https://www.linkedin.com/advice/1/what-optimal-length-social-media-post-gohwf> (accessed May 14, 2024).
- Loewenstein, George.** 1994. "The Psychology of Curiosity: A Review and Reinterpretation." *Psychological Bulletin* 116 (1): 75.
- Loewenstein, George, and Zachary Wojtowicz.** 2025. "The Economics of Attention." *Journal of Economic Literature* 63 (3): 1038–89.
- Maxwell, Sean L., Tom Evans, James E.M. Watson, Alexandra Morel, Hedley Grantham, Adam Duncan, Nancy Harris, Peter Potapov, Rebecca K. Runting, Oscar Venter, Stephanie Wang, and Yadvinder Malhi.** 2019. "Degradation and Forgone Removals Increase the Carbon Impact of Intact Forest Loss by 626%." *Science Advances* 5 (10): eaax2546.
- Metzger, Miriam J., Andrew J. Flanagin, Paul Mena, Shan Jiang, and Christo Wilson.** 2021. "From Dark to Light: The Many Shades of Sharing Misinformation Online." *Media and Communication* 9 (1): 134–43.
- Mina, Michael J., Tomasz Kula, Yumei Leng, Mamie Li, Rory D. De Vries, Mikael Knip, Heli Siljander, et al.** 2019. "Measles Virus Infection Diminishes Preexisting Antibodies That Offer Protection from Other Pathogens." *Science* 366 (6465): 599–606.
- Mosleh, Mohsen, Gordon Pennycook, and David G. Rand.** 2020. "Self-Reported Willingness to Share Political News Articles in Online Surveys Correlates with Actual Sharing on Twitter." *Plos ONE* 15 (2): 1–9.
- Munch, Joe.** 2023. Ten Types of Sentences Every Scientific Paper Should Have. <https://www3.mdanderson.org/library/education/pdf/10-types-of-sentences.pdf> (accessed July 3, 2023).
- National Academies of Sciences, Engineering, and Medicine.** 2017. *Communicating Science Effectively: A Research Agenda*. The National Academies Press.
- Niitsuma, K., Kinoshita, T., and Takahashi, H.** 2025. "Prestige Bias Drives the Viral Spread of Content Reposted by Influencers." *Scientific Reports* 15 (1): 98
- Osmundsen, Mathias, Alexander Bor, Peter Bjerregaard Vahlstrup, Anja Bechmann, and Michael Bang Petersen.** 2021. "Partisan Polarization is the Primary Psychological Motivation behind Political Fake News sharing on Twitter." *American Political Science Review* 115 (3): 999–1015.
- Pariser, Eli.** 2011. *The Filter Bubble: How the New Personalized Web Is Changing What We Read and How We Think*. Penguin.
- Pennycook, Gordon, and David G. Rand.** 2021. "The Psychology of Fake News." *Trends in Cognitive Sciences* 25 (5): 388–402.
- Perrault, Aurore A., Abbas Khani, Charles Quairiaux, Konstantinos Kompotis, Paul Franken, Michel Muhlethaler, Sophie Schwartz, and Laurence Bayer.** 2019. "Whole-Night Continuous Rocking Entrain Spontaneous Neural Oscillations with Benefits for Sleep and Memory." *Current Biology* 29 (3): 402–11.
- Peters, Ellen.** 2020. *Innumeracy in the Wild: Misunderstanding and Misusing Numbers*. Oxford University Press.
- Pitzalis, Josh.** 2022. "How to make a twitter thread (with examples that won't make you cringe.))" <https://getchirrapp.com/how-to/twitter-threads> (accessed May 14, 2024).
- Qiu, Jingyi, and Russell Golman.** 2022. "Curiosity in News Consumption." *Applied Cognitive Psychology* 38 (2): e4195.
- Rinker, T.** 2023. Sentimentr. <https://cran.r-project.org/web/packages/sentimentr> (accessed March 22, 2023).

- Robertson, Claire E., Nicolas Pröllochs, Kaoru Schwarzenegger, Philip Pärnamets, Jay J. Van Bavel, and Stefan Feuerriegel.** 2023. "Negativity Drives Online News Consumption." *Nature Human Behaviour* 7 (5): 812–22.
- Roozenbeek, Jon, Jane Suiter, and Eileen Culloty.** 2023. "Countering Misinformation: Evidence, Knowledge Gaps, and Implications of Current Interventions." *European Psychologist* 28 (3): 189–205.
- Sanchez-Pages, Santiago, and Marc Vorsatz.** 2007. "An Experimental Study of Truth-Telling in Sender-Receiver Game." *Games and Economic Behavior* 61 (1): 86–112.
- Schimmel, Joshua.** 2012. *Writing Science: How to Write Papers That Get Cited and Proposals That Get Funded*. Oxford University Press.
- Senior, J.** 2016. Review: "The Attention Merchants' Dissects the Battle for Clicks and Eyeballs." *New York Times* <https://www.nytimes.com/2016/11/03/books/review-attention-merchants-tim-wu.html>.
- Serra-Garcia, Marta.** 2026. *Data and Code for: "The Attention-Information Trade-Off"*. American Economic Association; distributed by Inter-university Consortium for Political and Social Research, <https://doi.org/10.3886/E241261V1>.
- Serra-Garcia, Marta, and Uri Gneezy.** 2021. "Mistakes, Overconfidence and the Effect of Sharing in Detecting Lies." *American Economic Review* 111 (10): 3160–83.
- Simon, Herbert A.** 1971. "Designing Organizations for An Information-Rich World." In *Computers, Communications, and the Public Interest*, edited by M. Greenberger, 37-52. Johns Hopkins University Press.
- Smith, Stephanie M., and Ian Krajbich.** 2018. "Attention and Choice across Domains." *Journal of Experimental Psychology: General* 147 (12): 1810.
- Smirnova, Inna, Markus Reitzig, and Olav Sorenson.** 2022. "Building Status in an Online Community." *Organization Science* 33 (6): 2519–40.
- Srinivasan, Karthik.** 2023. "Paying Attention." Unpublished.
- Stryker, Jo Ellen, Cortney M. Moriarty, and Jakob D. Jensen.** 2008. "Effects of Newspaper Coverage on Public Knowledge about Modifiable Cancer Risks." *Health Communication* 23 (4): 380–90.
- Sumner, Petroc, Solveiga Vivian-Griffiths, Jacky Boivin, Andrews Williams, Lewis Bott, Rachel Adams, and Christopher D. Chambers.** 2016. "Exaggerations and Caveats in Press Releases and Health-Related Science News." *PLoS ONE* 11 (12): 1–15.
- Toubia, Olivier, and Andrew T. Stephen.** 2013. "Intrinsic vs. Image-Related Utility in Social Media: Why do People Contribute Content to Twitter?" *Marketing Science* 32 (3): 368–92.
- Thaler, Michael.** 2024. "The Supply of Motivated Beliefs." Unpublished.
- Vosoughi, Soroush, Deb Roy, and Sinan Aral.** 2018. "The Spread of True and False News Online." *Science* 359 (6380): 1146–51.
- Wu, Tim.** 2017. *The Attention Merchants: The Epic Scramble to Get Inside our Heads*. Knopf.
- Yavchitz, Amélie, Isabelle Boutron, Aida Bafeta, Ibrahim Marroun, Pierre Charles, Jean Mantz, and Philippe Ravaud.** 2012. "Misrepresentation of Randomized Controlled Trials in Press Releases and News Coverage: A Cohort Study." *PLoS Medicine* 9 (9): 1–11.
- Zimmermann, Florian.** 2020. "The Dynamics of Motivated Beliefs." *American Economic Review* 110 (2): 337–63.

# Online Appendix

## **The Attention-Information Tradeoff**

by Marta Serra-Garcia (UC San Diego)

# Table of Contents

<b>A</b>	<b>Sender Experiment: Additional Information</b>	<b>4</b>
A.1	Professionals: Implementation . . . . .	4
A.2	Professionals: Instructions . . . . .	5
A.3	Research Articles . . . . .	6
A.4	Sender Materials: Example . . . . .	7
A.5	Sender Summaries: Examples . . . . .	10
<b>B</b>	<b>Receiver Experiments: Additional Information</b>	<b>12</b>
B.1	Overview and Procedures . . . . .	12
B.2	Instructions . . . . .	14
B.3	Knowledge Questions . . . . .	20
<b>C</b>	<b>Sender Behavior: Additional Results</b>	<b>29</b>
C.1	Pre-registered Analyses . . . . .	29
C.2	Sender Incentives & Punctuation . . . . .	33
C.3	Sender Incentives & Reporting of Sample and Implications . . . . .	35
C.4	Knowledge Content in Summaries . . . . .	39
C.5	Summary-Level Tradeoffs and Heterogeneity . . . . .	41
<b>D</b>	<b>Online Attention to Research Articles</b>	<b>42</b>
D.1	Data and Coding . . . . .	42
D.2	Findings . . . . .	42
<b>E</b>	<b>Receiver Behavior: Additional Results</b>	<b>45</b>
E.1	Receiver Knowledge When Exposed to Summaries . . . . .	45
E.2	Receiver Clicks and Knowledge . . . . .	56
E.3	Receiver Beliefs & Intentions . . . . .	62
E.4	Heterogeneity in Click Rates and Knowledge . . . . .	66
E.5	Sharing Beliefs: Experimental Evidence . . . . .	69
E.6	Donation Decisions: Experimental Evidence . . . . .	74
<b>F</b>	<b>LLM: Details and Additional Results</b>	<b>76</b>

F.1 LLM as Sender . . . . .	76
F.2 LLM as Coder . . . . .	86
<b>G Text Coding: Instructions for Coders</b>	<b>88</b>

# A Sender Experiment: Additional Information

## A.1 Professionals: Implementation

**Recruitment.** To recruit senders, the research team searched among freelancer under the category “Social Media Copy” or the category “Research & Summaries”, restricting freelancers to be based in the US, Canada, and the UK. Then, freelancers were contacted via a direct message if their posted price for a writing job, that was similar to the one in the experiment, was within the range of \$10 and \$35.

An example of a message sent to freelancers at initial contact: *Hi [NAME]! I am looking for a writer like you to write some brief summaries (or captions) of research articles! Would you like to write 4 summaries, of 70 to 100 words approx., each based on a 2-page summary of four different research articles (about sleep, cancer, vaccines and climate)? These summaries will include language that is easy to read (non-technical), in addition to language that is more complex (technical). Could you spend at most 10-15 minutes writing each summary? You would receive \$[PRICE] for your summaries. I would love you to work on this!*

If a freelancer was interested, they created a custom offer. This offer was accepted and the instructions were sent (a copy of the instructions is provided in Section A.2). The instructions also included a brief consent form and hence, after an order started, all freelancers were informed that their summaries are part of a research study.

The experiment was conducted on Fiverr in two waves. The first wave took place between January and February of 2023. In total, 108 professionals provided summaries. Since recruiting further senders within the price range became difficult, due to the limited pool of professionals, we continued recruitment one year later, in February of 2024, to add 41 professionals, reaching almost 150 senders, as pre-registered. Table B.1. compares the main features of senders’ messages across waves. Each row is a separate linear regression that includes indicator variables for the second wave (Wave 2) and interactions with sender incentives. The table shows that none of the interaction coefficients are significant. There are differences in the levels of the style index and conclusions, across waves. We include controls for recruitment wave in all analyses.

In total, 239 freelancers were contacted. Of these, 160 (67%) responded and accepted the request. Almost all freelancers completed the request (149 or 93%).

**Professional’s descriptive characteristics.** Out of 149 senders, 76 had posted their writing work offers under “Social Media Copy” and 73 had posted it under “Research and summaries.” For this group, the gender could be estimated from the profile pictures and usernames for 144 out of 149. Of these, 91 (63%) had a profile picture with a female-looking individual (and a corresponding female-sounding username).

Table A.1: Coefficients of wave effects, senders

Message Feature	(1) Mean	(2) SD	(3) Wave 2	(4) Wave 2 X Clickbait-Incentives	(5) Wave 2 X Viral-Incentives
Style Index	.362	.969	0.042	-0.133	0.054
Units: Accurate-In text	3.807	1.819	-0.000	0.301	-0.955
Units: Inaccurate-In text	.361	.621	0.073	-0.196	0.030
Units: Not in text	1.341	1.409	0.320	-0.192	0.451
Units: Introduction	1.81	1.228	-0.190	0.019	0.028
Units: Method	.299	.555	0.010	-0.020	-0.131
Units: Finding	1.97	1.144	-0.264	0.184	-0.021
Units: Conclusion	1.345	1.002	0.738***	-0.411	-0.411
Units: Call to Action	.086	.298	0.098*	0.141	0.061

Notes: Each row of this table reports the coefficients of a regression on this variable as dependent variable, with controls that include Wave 2, Wave 2 X Clickbait-Incentives, and Wave 2 X Viral-Incentives (in addition to indicators for sender incentives, paper fixed effects, and sender’s gender and specialization). The first two columns report the mean and SD of the dependent variable. Columns (3)-(4) report the coefficients for the indicators Wave 2, Wave 2 X Clickbait-Incentives, and Wave 2 X Viral-Incentives. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ .

An important question is whether these professionals have sufficient experience in writing, and whether their experience has had a focus on engaging audiences or attracting their attention. Most professionals post profile information on the platform. We could download the self-reported past experience under the professionals’ profiles for 138 professionals out of 149.

Two coders classified the profile information according to the following categories. First, whether the professional reports writing experience in their profile. Second, whether the professional reports experience with work that aims to attract the attention of the audience, persuade or create following on social media. Third, whether the professional mentions how much experience they have and, if so, how much experience is reported. Fourth, whether the professional mentions working in the digital domain explicitly, and fifth the writing context in which they focus their work.

A large majority report experience with writing on their profile (124 out of 138, or 90%). Among them, 83 (67%) explicitly mention their writing has been aimed at attracting attention, and 70 (56%) explicitly mention their writing is in the digital domain. Professionals mention the length of their experience in 69 (50%) cases, and provide an exact number in years in 52 (or 75%) of these cases. Their average reported experience is 7.5 years (SD=4.1), indicating that they report extensive experience in this task.

## A.2 Professionals: Instructions

*The instructions provided to freelancers are shown below. The brackets indicate each treatment variation. Info refers to Info-Incentives, Viral to Viral-Incentives, and Clickbait to Clickbait-Incentives.*

Thank you for accepting this request. I'm looking forward to working with you!

What is the goal in asking you to write captions?

- [Info: I'm looking to have **informative captions** (summaries) of the research articles described below.]
- [Viral & Clickbait: I'm looking to have attention-grabbing, interesting captions (summaries) of the research articles described below.]
- [Info: These summaries may be posted on a social media account (e.g., Twitter), and I'd like to **provide accurate information to potential readers** about these research articles.]
- [Clickbait: These summaries may be posted on a social media account (e.g., Twitter), and I'd like to **stimulate readers to read more about these research articles.**]
- [Viral: These summaries may be posted on a social media account (e.g., Twitter), and I'd like to **maximize the number of times that the thread, which will include your summary, is shared.**]
- This is not for business, but only to promote recent research findings.
- Target audience: the general population.

I'd like you to spend around **10-15 minutes writing each caption.**

After you submit the captions, I will read them and approve your work. [Info: I'll also ask someone else to read one of your summaries and if he/she answers several questions about the research correctly, as a pre-test, I'll tip you!] [Viral: I'll also ask someone else to read one of your summaries and others that I am collecting and if he/she believes yours would be one that is shared most often, as a pre-test, I'll tip you!] [Clickbait: I'll also ask someone else to read one of your summaries and several others. If he/she chooses to read more about the research you summarized, as a pre-test, I'll tip you!]

Thank you!

Following these instructions, freelancers were provided with the materials for each of the studies (4 in total). Example materials are shown in Section A.4.

### **A.3 Research Articles**

This section briefly describes the selection of the research articles and describes their main findings briefly. The journal articles focus on four key policy topics (cancer, vaccines, sleep,

and climate). The articles are selected such that they can be of likely interest to a wide non-expert audience. To proxy for such interest, the published research articles were selected from articles covered by the New York Times during 2019, prior to the COVID-19 pandemic. For cancer, Lee et al. (2019) showed that a molecule found in cruciferous vegetables, such as broccoli, reduced tumor growth in mice and human cells in the lab. The second article, Kim et al. (2019) showed an association between vitamin A intake and skin cancer, in a longitudinal study.

For sleep, Gangwisch et al. (2020) showed that diets with a low glycemic index were associated with a lower incidence of insomnia among postmenopausal women. Perrault et al. (2019) showed that sleeping in a rocking bed can shorten sleep onset time and improve memory, via a laboratory study with 18 young adults who were good sleepers.

For vaccines, Mina et al. (2019) reports that a measles infection is harmful for the organisms' antibodies, encouraging MMR vaccination. Hviid et al. (2019) reported that MMR vaccines were not associated with autism, in a nationwide cohort study in Denmark.

For climate, Maxwell et al. (2019) showed that deforestation of intact tropical forests led to a stronger impact on carbon emissions than previously calculated. Berzaghi et al. (2019) showed that forest elephants affect forest growth in Africa and thereby also carbon emissions. These articles suggest that, to reduce carbon emissions, preservation of intact tropical forests and conservation of forest elephants can be crucial.

#### A.4 Sender Materials: Example

*Below we provide an example of the materials provided to senders for one of the research articles on cancer, by Kim et al. (2019). These materials are comprised of the study's abstract, its press release, and a link to the entire research article.*

**Scientific Abstract Importance:** Retinoids are bioactive forms of vitamin A that are essential in the maintenance of epithelial maturation and differentiation. Synthetic retinoids are used in chemoprevention of skin cancer among high-risk populations with potential adverse effects. Epidemiologic data on vitamin A intake and risk of cutaneous squamous cell carcinoma (SCC) are limited.

**Objective:** To examine whether vitamin A intake is associated with a reduction in SCC risk.

**Design, Settings, and Participants:** This cohort study prospectively examined intake of vitamin A and carotenoids and SCC risk in the Nurses' Health Study (1984-2012) and the Health Professionals Follow-up Study (1986-2012). Diet was assessed repeatedly. Incident

SCC was confirmed by pathologic reports. Data analysis was performed from June 21, 2017, to December 4, 2018. Exposures: Intakes of vitamin A, retinol, and carotenoids.

**Main Outcomes and Measures:** Incident SCC. Cox proportional hazards regression models were used to compute cohort-specific hazard ratios (HRs) and 95% CIs. Pooled HRs of the cohort-specific results were calculated.

**Results:** A total of 3978 SCC cases in 75,170 women in the Nurses' Health Study (mean [SD] age, 50.4 [7.2] years) and 48,400 men in the Health Professionals Follow-up Study (mean [SD] age, 54.3 [9.9] years) were documented. Higher total vitamin A was associated with a reduction in SCC risk; with quintile 1 as the reference, the pooled multivariate HRs for the increasing quintiles of vitamin A intake were 0.97 (95% CI, 0.87–1.07) for quintile 2, 0.97 (95% CI, 0.80–1.17) for quintile 3, 0.93 (95% CI, 0.84–1.03) for quintile 4, and 0.83 (95% CI, 0.75–0.93) for quintile 5 ( $P < .001$  for trend). Higher intakes of retinol and some carotenoids were also associated with a reduction in SCC risk; the pooled HRs for the highest quintiles of intake compared with the lowest quintiles were 0.88 (95% CI, 0.79–0.97;  $P = .001$  for trend) for total retinol, 0.86 (95% CI, 0.76–0.96;  $P = .001$  for trend) for beta cryptoxanthin, 0.87 (95% CI, 0.78–0.96;  $P < .001$  for trend) for lycopene, and 0.89 (95% CI, 0.81–0.99;  $P = .02$  for trend) for lutein and zeaxanthin. The results were generally consistent by sex and other SCC risk factors.

**Conclusions and Relevance:** This study suggests that increased intake of dietary vitamin A is associated with decreased risk of incident SCC. Future studies are needed to determine whether vitamin A supplementation has a role in chemoprevention of SCC.

### Non-technical Summary

People whose diets included high levels of vitamin A had a 17 percent reduction in risk for getting the second-most-common type of skin cancer, as compared to those who ate modest amounts of foods and supplements rich in vitamin A. That's according to researchers from Brown University, who unearthed that finding after analyzing data from two long-term observational studies.

Cutaneous squamous cell carcinoma is the second-most-common type of skin cancer among people with fair skin. Vitamin A is known to be essential for the healthy growth and maturation of skin cells, but prior studies on its effectiveness in reducing skin cancer risk have been mixed, said Eunyoung Cho, an associate professor of dermatology and epidemiology at Brown.

“Our study provides another reason to eat lots of fruits and vegetables as part of a healthy

diet,” said Cho, who is also an associate epidemiologist at Brigham and Women’s Hospital. “Skin cancer, including squamous cell carcinoma, is hard to prevent, but this study suggests that eating a healthy diet rich in vitamin A may be a way to reduce your risk, in addition to wearing sunscreen and reducing sun exposure.” The findings were published in the Journal of the American Medical Association Dermatology.

The research team led by Cho looked at the diet and skin cancer results of participants in two large, long-term observational studies: the Nurses’ Health Study, which followed 121,700 U.S. women from 1984 to 2012, and the Health Professionals Follow-Up Study, which followed 51,529 U.S. men from 1986 to 2012.

Between the two studies, some 123,000 participants were white (and thus had significant risk of developing skin cancer), had no prior history of cancer and completed the dietary reports multiple times. Among these individuals included in the team’s subsequent analysis, a total of 3,978 cases of squamous cell carcinoma were reported and verified within the 24- or 26-year follow-up periods.

Both studies also asked the participants about hair color, the number of severe sunburns they had received in their lifetime and any family history of skin cancer, and the researchers adjusted for these and other factors. The studies did not, however, ask participants about their avoidance of mid-day sun, known to be a major risk factor for skin cancer.

After grouping the study participants into five categories by vitamin A intake levels, the researchers found that people in the category with the highest average daily total vitamin A intake were 17 percent less likely to get skin cancer than those in the category with the lowest total vitamin A intake.

Those in the highest category reported eating on average the amount of vitamin A equivalent to one medium baked sweet potato or two large carrots each day. Those in the lowest category reported eating a daily average amount of vitamin A equivalent to one-third cup of sweet potato fries or one small carrot, which is still above the U.S. Recommended Dietary Allowance of vitamin A.

The team also found that the majority of vitamin A came from the participants’ diets, particularly from fruits and vegetables, rather than from animal-based foods or vitamin supplements. Plant-based sources of vitamin A include not only sweet potatoes and carrots, but leafy green vegetables and fruits like apricots and cantaloupe. Milk, some types of fish and liver are rich sources of animal-based vitamin A.

Cho cautioned that too much vitamin A, particularly from supplements and animal sources,

can lead to nausea, liver toxicity, increased risk of osteoporosis and hip fracture, and even birth defects. Side effects from high levels of plant-based vitamin A are minimal, she added.

The researchers also found that eating high levels of other plant-based pigments similar to vitamin A — such as lycopene, commonly found in tomatoes and watermelon — was associated with decreased risk of skin cancer.

Because the analysis was based on studies surveying a large number of people about the foods they ate and observing whether or not they got skin cancer, rather than a randomized clinical trial, it cannot establish cause and effect. It's possible that another factor may have led to the differences — such as the fact that people who consumed more vitamin A also tended to drink less alcohol.

As a next step, Cho would like to conduct a clinical trial to see if vitamin A supplements can prevent squamous cell carcinoma. However, she added, conducting a dietary clinical trial is quite challenging on a technical level, as is ensuring that participants actually stick to the diet.

The link to the complete research study is here [link provided].

## A.5 Sender Summaries: Examples

Three example summaries for the paper by Gangwisch et al. (2020) on the association between diets with a low glycemic index and the incidence of insomnia among postmenopausal women. One summary for each treatment in the Sender Experiment is shown below.

### Information incentives:

*Headline: Consumption of Refined Carbohydrates Linked to Insomnia in Postmenopausal Women*

*A longitudinal study by Columbia University looked at the glycemic index (GI), a measure of refined carbohydrate consumption, of over 50,000 postmenopausal participants in the Women's Health Initiative. They found that postmenopausal women with higher GIs are more likely to have insomnia, while those with diets high in fruits and vegetables are less likely to have insomnia. The researchers hope to investigate the potential of dietary substitutions as potential treatments for insomnia, which affects around 30% of adults.*

### Clickbait-Incentives:

*Headline: Could Your Dinner Be Keeping You Awake? New Study Discovers Surprising Link Between Carbohydrates and Insomnia*

*Wake up to the reality: eating too many carbohydrates before bed may cause insomnia! Increased insulin levels by eating a high-carb meal can prevent the body's melatonin and other hormones from naturally promoting sleep. To promote better sleep, it is advised to choose a light, protein-based snack before bed instead of a dinner that is high in carbohydrates.*

### **Viral-Incentives:**

*Headline: Can't Sleep? Blame Your Sweet Tooth! New Study Links Refined Carbs to Insomnia in Women 🤔🔍🚫 #sleep #diet #healthresearch*

*Findings from Columbia University Vagelos College of Physicians and Surgeons reveal that a diet high in refined carbs and added sugars could be contributing to insomnia in postmenopausal women. But fear not, boosting your intake of veggies, fiber, and whole fruit (not juice) could be the key to getting a better night's sleep. With 30% of adults struggling with insomnia, this low-cost and natural solution could be a game-changer. Get the full scoop in the American Journal of Clinical Nutrition. #Insomnia #Diet #HealthResearch*

# B Receiver Experiments: Additional Information

## B.1 Overview and Procedures

We outline the design of the Knowledge and Click experiments in Figures B.1 and B.2 .

Figure B.1: Knowledge Experiments

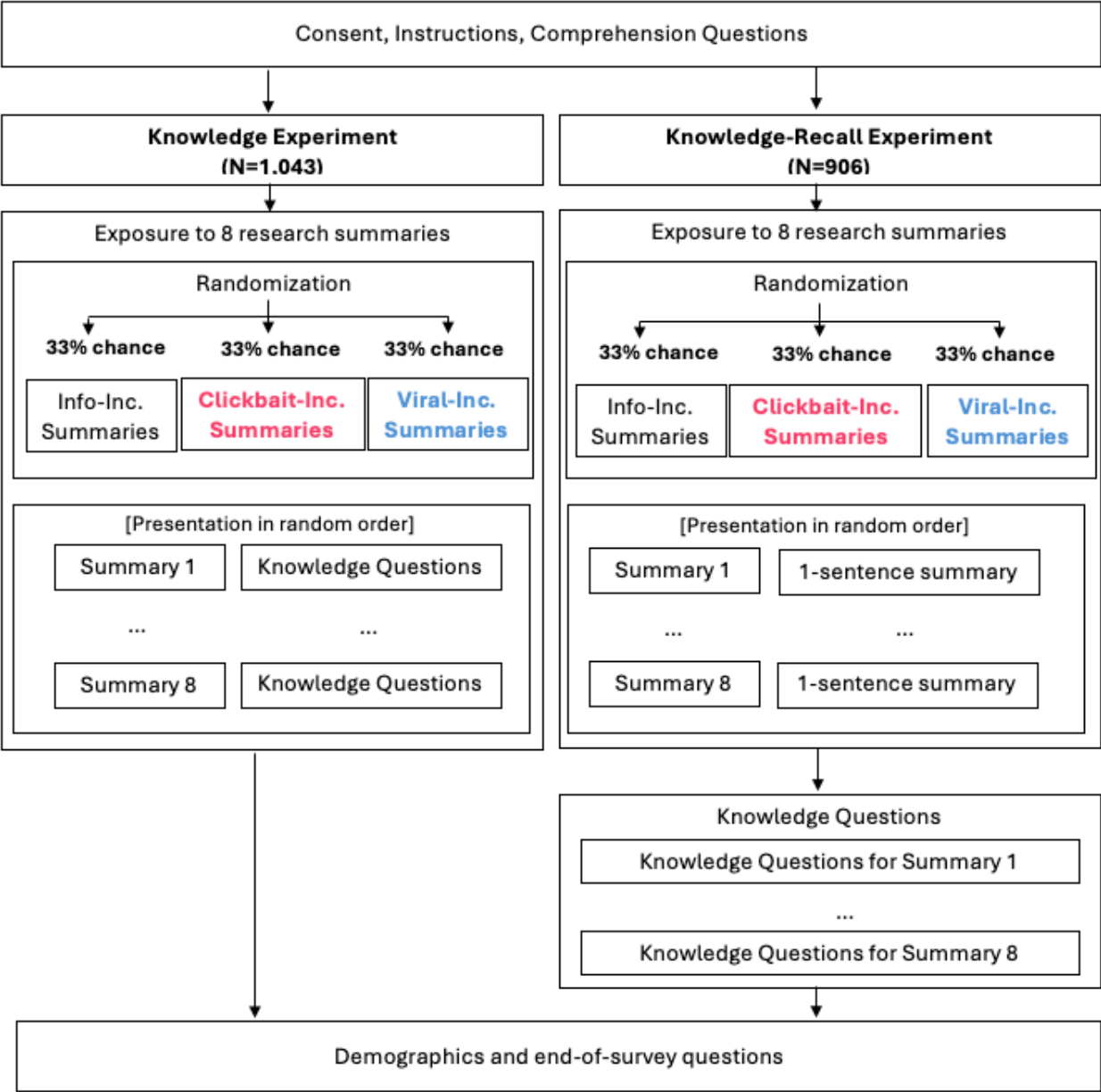
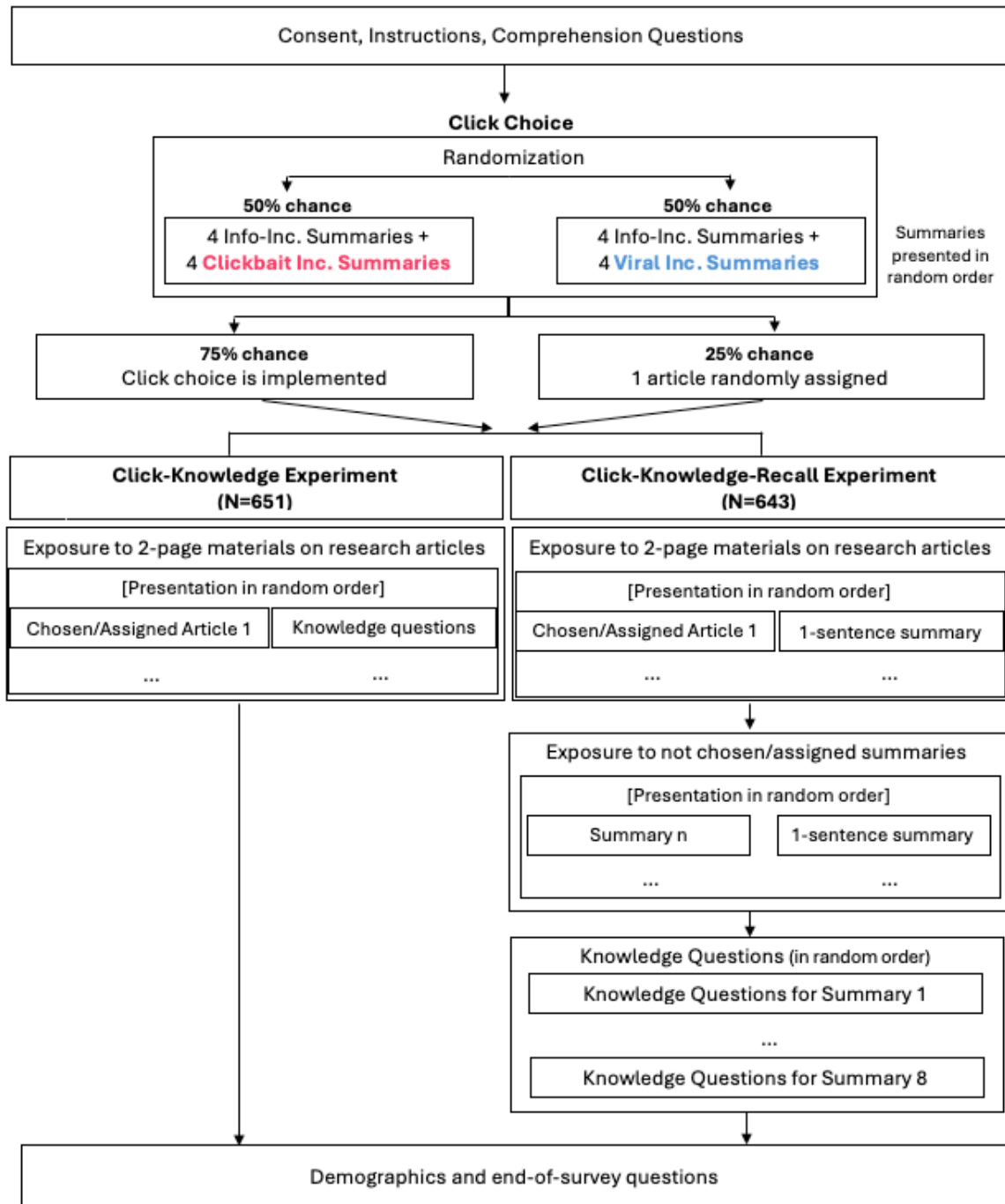


Figure B.2: Click-Knowledge Experiments



The Receiver experiments were pre-registered on Aspredicted. Table B.1 shows the experiments conducted and the corresponding pre-registration numbers. All Receiver experiments were conducted on Prolific Academic.

Table B.1: Experimental Design: Pre-registrations and Sample Sizes

Role	Experiment	Final N	Pre-reg. #	N in pre-reg	Date
Sender	Professionals	149	<a href="#">118480</a>	150 (if possible)	Jan-23
Receiver	<i>Summaries by professionals:</i>				
	Knowledge	541	<a href="#">126292</a>	540	Mar-23
	Click-Knowledge	307	<a href="#">128234</a>	300	Apr-23
	Beliefs & Intentions	501	<a href="#">165440</a>	500	Mar-24
	Knowledge & Click-Knowledge (Wave 2), Knowledge-Recall & Click-Knowledge-Recall	2395	<a href="#">170901</a>	2350	Apr-24
	<i>Summaries by LLM:</i>				
	Knowledge - GPT	360	<a href="#">126898</a>	360	Mar-23
Click - GPT	299	<a href="#">129097</a>	300	Apr-23	
Robustness	<i>Summaries by professionals &amp; LLM:</i>				
	Sharing Inc.- Profess.+GPT	527	<a href="#">134042</a>	600	May-23
	Sharing - Wave 2	349	<a href="#">170901</a>	350	Apr-24
	Sharing Uninc. - Profess+GPT	404	<a href="#">130993</a>	400	May-23
	Donation - Profess.+GPT	505	<a href="#">132998</a>	500	May-23

*Notes:* This table displays the experiments, sample sizes, and pre-registrations. The pre-registrations can be found on Aspredicted by introducing the pre-registration number or using the hyperlinks above.

To participate in the experiment, participants had to have an approval rating of 95–100%, and be located in the United States. All waves of recruitment were designed so that they would be gender-balanced, achieving close to a 50% share of participants who identify as female and 50% of participants who identify as male.

In all experiments, the payment was calculated such that receivers would be paid \$12 per hour. Focusing on the main experiments, the payment in the Knowledge experiment was \$3 for a 15-minute long study, in the Knowledge-Recall experiment it was \$4 for a 20-minute long study. The Click experiment paid \$1 for a 5-minute long study, though participants clicked and spent on average 10.95 minutes. Participants in the Click-Knowledge-Recall had to summarize and answer knowledge questions for all research articles and thus received \$5 for a 25-minute long study.

## B.2 Instructions

### B.2.1 Knowledge Experiment Instructions

*The experiment was conducted on Qualtrics. After participants consented to participate in the study, they saw the following screens. Across participants, the summaries they were exposed to were either from the Information incentives, Clickbait-Incentives, or Viral-Incentives treatments. The summaries were shown in random order.*

In the following screens, you will complete the following steps:

- Read 8 summaries about a research study. Each summary was written by someone who read a detailed summary of the study and was given access to the complete research paper.
- Answer 4 multiple choice questions about the research study. You will receive a \$0.10 bonus payment each time you answer a question correctly. There are a total of 32 short questions.
- Depending on the summary you read and the answers you select, you could earn up to \$3.20!

You may not always be able to answer all of the questions correctly, as the information in the summaries varies.

**Comprehension Question: Which of the following is correct? In each question in this part my task is...**

Please re-read the instructions. You will have 2 opportunities to answer this question correctly.

- ...to read the summary about a research study and answer questions about it.
- ...to choose the summary about a research study that you would like to correct and edit.
- ...to choose the summary about a research study that will be rated highest by another participant.

**Comprehension Question: Which of the following is correct? I receive...**

Please re-read the instructions. You will have 2 opportunities to answer this question correctly.

- ...a \$3.20 bonus only if I answer all questions correctly, and \$0 otherwise.
- ...a \$0.10 bonus for each question I answer correctly.
- ...a \$0.10 bonus for each question I answer.

---

*[Prior to seeing each summary, they saw the following screen, where  $X$  increased from 1 to 8 as the participant progressed through the experiment. The order of the summaries was randomized.]*

In the next screens you will see summary  $X$  and answer 4 questions about it. Please read the summary and the questions carefully.

---

[Participants next answered the questions shown in Section B.3].

## **B.2.2 Knowledge-Recall Experiment Instructions**

*The experiment was conducted on Qualtrics. After participants consented to participate in the study, they saw the following screens. Across participants, the summaries they were exposed to were either from the Info-Incentives, Clickbait-Incentives, or Viral-Incentives treatments. The summaries were shown in random order.*

### **This Study**

This study consists 2 of parts, Part I and Part II. You will first receive information about Part I. After you've completed it, you'll receive information about Part II.

---

### **This Study: Part I**

In this part you will be shown 8 summaries about different research studies.

Each summary was written by someone who read a detailed summary of the study and was given access to the complete research paper.

### **Your Task**

You will be asked to recap the summary in 1 sentence, using your own words.

### **Comprehension Question: Which of the following is correct? In each question in this part my task is...**

Please re-read the instructions. You will have 2 opportunities to answer this question correctly.

- ...to read the summary about a research study and describe what it is about in 1 sentence.
  - ...to choose the summary about a research study that you would like to correct and edit.
  - ...to choose the summary about a research study that will be rated highest by another participant.
- 

[After they had read the summaries and written their own 1-sentence summary, they proceeded to Part II.]

---

Thank you for writing about the research summaries. You've completed Part I.

Click below to start Part II.

---

## **Part II**

In Part II, you will answer 4 multiple choice questions about each of the 8 research studies you just read about (and wrote a sentence for).

- You will receive a \$0.10 bonus payment each time you answer a question correctly. There are a total of 32 short questions.
- Depending on the summary you read and the answers you select, you could earn up to \$3.20!
- You may not always be able to answer all of the questions correctly, as the information in the summaries varies.

*[Same comprehension questions were presented as in the Knowledge Experiment.]*

---

*[Next the Knowledge Questions shown in Section B.3 were presented. Prior to showing the questions of each of the eight research articles, the instructions stated "Recall the research summary about [topic]".]*

---

### **B.2.3 Click-Knowledge Experiment Instructions**

*The experiment was conducted on Qualtrics. After participants consented to participate in the study, they saw the following screens. Across participants, the summaries they were exposed to were either from the Information and Clickbait-Incentives treatments or the Information and Viral-Incentives treatments. The summaries were shown in random order.*

#### **This Study**

In the following you will be shown 8 summaries about different research studies.

Each summary was written by someone who read a detailed summary of the study and was given access to the complete research paper.

---

### **Your Choice**

We will ask you to carefully read the 8 summaries. You will choose whether you would like to read more about one or more of the summaries. You can indicate that you would like to read more about as many as you wish, from none to all of them.

After you make your choices, the computer will implement your decisions, with a 3 out of 4 chance (75%). Otherwise, with a 1 out of 4 chance (25%), it will randomly pick one research study.

If you choose to read more or are assigned one research study, you will be presented with 1-2 pages of additional information about the research studies. If you did not choose to read more and are not assigned to a study, you will proceed to the next part of the study.

**It is in your best interest to carefully choose whether you would like to read more about each study.**

### **Comprehension Question: Which of the following is correct?**

Please re-read the instructions above. You will have 2 opportunities to answer this question correctly.

#### **In each screen my task is...**

- ...to choose whether I would like to read more about the research studies that the summaries describe.
- ...to choose the summary about a research study that I would like to correct and edit.
- ...to choose the summary about a research study that will be rated highest by another participant.

### **Comprehension Question: Which of the following is correct?**

Please re-read the instructions. You will have 2 opportunities to answer this question correctly.

- All of my choices will be implemented.
- My choices will be implemented with a 75% chance. With a 3 out of 4 chance, if I indicated I would like to read more about the study in that choice, I will read more about it. If not, I will read more about another study. With a 1 out of 4 chance, the computer will randomly choose one study.
- The study I choose will never be implemented.

*[Next, participants saw 8 summaries on one screen, listed in random order, and could select as many as they wished. After they made their choices, they learned whether their choice was implemented. They were shown their selected reading, based on their clicks, or one randomly chosen reading. At the end of the screen on which the abstract and press release were displayed, the following text was shown and the knowledge questions were presented.]*

---

**Thank you for reading!**

Below we ask you to **answer four questions** about the research.

You will receive **\$0.10 for each question you answer correctly**. Since you could earn a bonus, please read the text and answer the questions carefully.

---

#### **B.2.4 Click-Knowledge-Recall Experiment Instructions**

*The experiment was conducted on Qualtrics. After participants consented to participate in the study, they saw the following screens. Across participants, the summaries they were exposed to were either from the Information and Clickbait-Incentives treatments or the Information and Viral-Incentives treatments. The summaries were shown in random order.*

##### **This Study**

This study consists 2 of parts, Part I and Part II. You will first receive information about Part I. After you've completed it, you'll receive information about Part II.

---

*[The instructions for Part I were then the same as those in the Click-Knowledge Experiment. Not repeated here for brevity.]*

---

*[Next, participants saw 8 summaries on one screen, listed in random order, and could select as many as they wished. After they made their choices, they learned whether their choice was implemented. They were shown their selected reading, based on their clicks, or one randomly chosen reading. At the end of the screen on which the abstract and press release were displayed, they were asked to write a 1-sentence summary about the research as shown below.]*

Please write a 1-sentence summary about the research:

---

*[After participants had read more about the research of their choice,, or the research they were randomly assigned to, they were shown all summaries they had not clicked to read more about, and as in the Knowledge-Recall experiment, they were asked to write one sentence about each of them.]*

Thank you for your choices!

Below you see some of the summaries again. Please write one short sentence summarizing each of them.

---

*[After they had written their own 1-sentence summary, they proceeded to Part II.]*

---

Thank you for writing about the research summaries. You've completed Part I.

Click below to start Part II.

---

*[The instructions for Part II were the same as those in Part II of the Knowledge-Recall Experiment. Not repeated here for brevity.]*

### **B.3 Knowledge Questions**

Each question asked the participant “Which statement is true?”. Participants could only select one answer out of the 4 available options. After each answer option, whether it is correct or incorrect is indicated in squared brackets.

Additionally, to establish whether the errors of receivers are biased, two features of incorrect answers are coded: whether they describe a larger sample than the correct one. and whether they describe a more representative sample than the correct one. An incorrect answer option is classified as more representative if it is closer to an adult participant in the United States. This classification is used for articles about cancer, sleep, and vaccines, but not for climate articles, as they focused on carbon emissions and were not directly concerned with human health. The words in italics, *larger sample* and *more representative*, are added in the corresponding incorrect answer options.

### B.3.1 Article: Kim et al. (2019)

1. Which statement is true? The study found that...

- ...individuals with diets high in vitamin A have a 38% lower risk of SCC, a form of skin cancer. [Incorrect]
- ...individuals who consume vitamin supplements have a 17% lower risk of SCC, a form of skin cancer, than those who do not consume them. [Incorrect]
- ...individuals with diets high in vitamin A have a 17% lower risk of SCC, a form of skin cancer, than those with low vitamin A consumption. [Correct]
- ...consuming a high amount of vitamin A causes the risk of SCC, a form skin cancer, to drop by 17%. [Incorrect]

2. Which statement is true?

- The participants were over 10,000 women who had skin cancer between 1980 and 1995. [Incorrect]
- The participants were 9,500 US adults interviewed in 2012. [Incorrect - *more representative*]
- The participants were over 10,000 cancer patients who were followed between the early 2000s and 2012. [Incorrect]
- The participants were over 100,000 men and women who are nurses and health professionals followed from the 1980s until 2012. [Correct]

3. Which statement is true?

- The study was a randomized clinical trial that changed participant's vitamin A intake. [Incorrect]
- The study was qualitative study based on interviews of cancer patients about their diets. [Incorrect]
- The study was based on 2 long-term observational studies that measured participants' diets and cases of skin cancer. [Correct]
- The study was a laboratory study in which skin cells were exposed to retinoids from vitamin A and the development of skin cancer was tracked. [Incorrect]

4. Which statement is true?

- The study authors recommend avoiding synthetic retinoids in the chemoprevention of skin cancer. [Incorrect]
- The study authors recommend taking high amounts of vitamin A from supplements and animal sources. [Incorrect]
- The study authors suggest that the next step would be to conduct a clinical trial to test whether higher intake of vitamin A reduces the risk of SCC. [Correct]
- The study authors indicate that clinical trials should not be the next step in testing the effects of vitamin A on SCC. [Incorrect]

### B.3.2 Article: Lee et al. (2019)

1. Which statement is true? The study found that...

- ...a molecule (I3C) in cruciferous vegetables harms a tumor suppressing gene, the PTEN gene. [Incorrect]
- ...a molecule (I3C) in cruciferous vegetables reduces tumor growth because it inactivates a gene found in many cancers, the WWP1 gene. [Correct]
- ...a molecule (I3C) in cruciferous vegetables increases tumor growth because it increases a cancer-causing gene, the WWP1 gene. [Incorrect]
- ... a molecule (I3C) in cruciferous vegetables is associated with lower odds of cancer among older adults. [Incorrect]

2. Which statement is true?

- The research sample consisted of human cells. [Incorrect - *more representative*]
- The research sample consisted of cancer prone mice and human cells. [Correct]
- The research sample consisted of over 10,000 adults with cancer. [Incorrect - *more representative, larger sample*]
- The research sample consisted of over 200 cancer patients who participated in the study to test the effects of a new molecule on cancer growth. [Incorrect - *larger sample*]

3. Which statement is true?

- The study tested the effect of a molecule (I3C) on tumor growth, focusing on its effect on the WWP1 gene and the activation of the PTEN gene. [Correct]
- The study analyzed the molecular composition diets of cancer patients and linked it to cancer diagnoses and development. [Incorrect]
- The study analyzed the molecular composition of different types of vegetables to find the most effective one in preventing cancer. [Incorrect]
- The study collected data on the diets of cancer patients at every stage of tumor development. [Incorrect]

4. Which statement is true? The authors conclude that...

- ...the promising effects of cruciferous vegetables seen in the laboratory will not be the same when tested in humans. [Incorrect]
- ...individuals should not change their diets yet, as too large amounts of cruciferous vegetables (over 6 lbs a day) would be needed to prevent cancer. [Correct]
- ...other types of vegetables are not a promising venue to prevent cancer in most people. [Incorrect]
- ...cruciferous vegetables are one of many types of vegetables that can help prevent cancer. [Incorrect]

### B.3.3 Article: Gangwisch et al. (2020)

1. Which statement is true? According to the study...

- ...a diet high in glycemic index causes insomnia among postmenopausal women. [Incorrect]
- ...a diet high in glycemic index is associated with higher odds of insomnia among postmenopausal women. [Correct]
- ...a diet high in processed fats is associated with higher odds of insomnia among postmenopausal women. [Incorrect]
- ...a diet high in processed fats causes insomnia among postmenopausal women. [Incorrect]

2. Which statement is true?

- The participants were over 10,000 adult women. [Incorrect, *more representative*]
- The participants were over 1,500 postmenopausal women. [Incorrect]
- The participants were over 5,000 adult women. [Incorrect, *more representative*]
- The participants were over 50,000 postmenopausal women. [Correct]

3. Which statement is true?

- The study was an observational (prospective cohort) study that measured women's diets using food diaries and followed them three years later. [Correct]
- The study was a qualitative study that interviewed women about their diets and insomnia. [Incorrect]
- The study was a randomized controlled trial that changed women's diets. [Incorrect]
- The study was a laboratory study in which women's sleep was measured after they were given high glycemic index foods. [Incorrect]

4. Which statement is true?

- The authors propose that animal experiments be conducted to understand the biological pathways connecting high glycemic foods and sleep processes. [Incorrect]
- The authors suspect that reducing refined carbohydrates in one's diet may be a low-cost way of preventing insomnia. [Correct]
- The authors discuss why their results may not hold for a broader population. [Incorrect]
- The authors propose that individuals should reduce their intake of carbohydrates 3-4 hours prior to going to sleep. [Incorrect]

### B.3.4 Article: Perrault et al. (2019)

1. Which statement is true? The study found that...

- ...participants sleeping on a rocking bed slept longer than participants sleeping on a stationary bed. [Incorrect]
- ...participants who slept on a rocking bed fell asleep faster and had better memory the next day than those on a stationary bed. [Incorrect]
- ...participants who regularly sleep in rocking beds fall asleep faster and have better memory. [Incorrect]
- ...participants fell asleep faster and had better memory the next day when sleeping on a rocking bed compared to a stationary bed. [Correct]

2. Which statement is true?

- The participants were 97 healthy young adults. [Incorrect, *larger sample*]
- The participants were 18 healthy young adults. [Correct]
- The participants were 18 adults, experiencing sleep problems. [Incorrect]
- The participants were 24 adults. [Incorrect, *more representative, larger sample*]

3. Which statement is true?

- Participants slept 3 nights in the lab. 1 to get used to sleep there. Then 2 more nights: 1 night on a gently rocking bed and 1 night on a stationary bed [Correct]
- Participants slept 1 night in the lab. Some slept on a gently rocking bed and others on a stationary bed. [Incorrect]
- Participants slept for 45 minutes in the lab, on a gently rocking bed or on a stationary bed. [Incorrect]
- Participants slept 7 nights in the lab on a gently rocking bed. [Incorrect]

4. Which statement is true? The study showed that rocking is important for...

- declarative memory, as it improves recall of day events. [Incorrect]
- for happiness, as it increases reported well-being. [Incorrect]
- for memory consolidation, as it improves performance in a word pairs test. [Correct]
- for cognition, as it improves performance in a cognitive reflection test. [Incorrect]

### B.3.5 Article: Mina et al. (2019)

1. Which statement is true? The study found that...

- ...measles leads unvaccinated children to lose antibodies to the same extent as when vaccinated children are infected. [Incorrect]

- ...measles leads unvaccinated children to lose up to 73% of their protective antibodies. [Correct]
- ...measles leads unvaccinated children lose approximately 85% of their protective antibodies. [Incorrect]
- ...measles leads unvaccinated children lose approximately 7% of their protective antibodies. [Incorrect]

2. Which statement is true?

- The participants were over 1,200 children in the Netherlands. [Incorrect, *larger sample*]
- The participants were 77 unvaccinated children in a community in the Netherlands. [Correct]
- The participants were over 1,200 vaccinated children in the Netherlands. [Incorrect, *larger sample*]
- The participants were 77 unvaccinated children in a community in the USA. [Incorrect, *more representative*]

3. Which statement is true?

- The study followed which other diseases unvaccinated children contracted after having measles. [Incorrect]
- The study analyzed blood samples of unvaccinated children before and after a measles infection using VirScan. [Correct]
- The study followed which other diseases of unvaccinated children contracted and compared them to those of vaccinated children. [Incorrect]
- The study predicted the likelihood of a measles infection on unvaccinated children using computer simulations. [Incorrect]

4. Which statement is true? The authors conclude that...

- ...re-vaccination for measles is important for already vaccinated children. [Incorrect]
- ...unvaccinated children are affected by a measles infection like vaccinated children. [Incorrect]
- ... measles vaccination is important to protect children from measles and other diseases. [Correct]
- ...VirScan should not be used to measure antibodies in blood samples. [Incorrect]

### B.3.6 Article: Hviid et al. (2019)

1. Which statement is true? The study found that...

- ...parents fear the MMR vaccine because it is associated with autism. [Incorrect]

- ...the MMR vaccine can cause autism. [Incorrect]
- ...the MMR vaccine is not associated with autism. [Correct]
- ...children with autism have severe negative reactions to the MMR vaccine. [Incorrect]

2. Which statement is true?

- The participants were over 10,000 children in the US born between 2005 and 2015. [Incorrect, *more representative*]
- The participants were over 250 children in Denmark born between 1999 and 2010. [Incorrect]
- The participants were over 600,000 children in Denmark born between 1999 and 2010. [Correct]
- The participants were over 600,000 children in the US born between 1999 and 2010. [Incorrect, *more representative*]

3. Which statement is true?

- The study used parental history of Autism and linked it to MMR vaccination. [Incorrect]
- The study used data containing children's' vaccination status and whether they had an autism diagnosis. [Correct]
- The study conducted surveys that asked parents about when their children were given the MMR vaccine and their assessment of their behavior around that time. [Incorrect]
- The study compared multiple countries regarding their rates of MMR vaccination and autism diagnoses. [Incorrect]

4. Which statement is true? The authors conclude that...

- ...the MMR vaccine should be given to children at an older age. [Incorrect]
- ...the MMR vaccine should not be given unless there are severe outbreaks of measles. [Incorrect]
- ...conducting surveys with parents is the best way to understand the possibly links between MMR vaccination and autism. [Incorrect]
- ...showing there is no association between the MMR vaccine and autism is important given the recent increase in vaccine hesitancy and measles outbreaks in Europe. [Correct]

### B.3.7 Article: Maxwell et al. (2019)

1. Which statement is true? The study showed that...

- ...the clearance of intact tropical forests overwhelmingly affects Indigenous people. [Incorrect]
- ...the net carbon impact of clearing intact tropical forests was 200% stronger than previously estimated. [Incorrect]
- ...the net carbon impact of clearing intact tropical forests was over 600% stronger than previously estimated. [Correct]
- ...the net carbon impact of clearing intact tropical forests was 50% stronger than previously estimated. [Incorrect]

2. Which statement is true?

- The study examined intact tropical forest losses from 2012 to 2013. [Incorrect]
- The study examined intact tropical forest losses in 2013. [Incorrect]
- The study examined intact tropical forest losses from 2000 to 2013. [Correct]
- The study examined intact tropical forest losses loss from 1990 to 2015. [Incorrect - *larger sample*]

3. Which statement is true? The study extended carbon accounting to...

- ...include other factors such as forgone carbon sequestration, selective logging and defaunation. [Correct]
- ...include its impact on the lives of Indigenous People. [Incorrect]
- ...compare selective logging and defaunation in tropical forests and boreal forests. [Incorrect]
- ...include its impact on human activity that follows after deforestation takes place. [Incorrect]

4. Which statement is true? The authors conclude that...

- ...intact forest retention receives sufficient funding from approaches such as REDD+. [Incorrect]
- ...Indigenous Peoples should be compensated for their lost income due to efforts to reduce deforestation in intact tropical forests. [Incorrect]
- ...intact forest retention needs to receive more attention and more funding from initiative such as REDD+. [Correct]
- ...it is important to focus efforts to reduce carbon emissions in areas with that have suffered from deforestation for a long period, rather than intact forest areas. [Incorrect]

### B.3.8 Article: Berzaghi et al. (2019)

1. Which statement is true? The study found that...

- ...forest elephants have suffered the effects of climate change in the last 50 years. [Incorrect]
- ...forest elephants are more important for carbon emissions than other large herbivores. [Incorrect]
- ...forest elephants affect tree growth and aboveground biomass, and thereby affect the carbon emissions of forests. [Correct]
- ...forest elephants need tree growth and lower carbon emissions to survive. [Incorrect]

2. Which statement is true?

- The study compared current and pre-colonization measurements of the rainforests in the region. [Incorrect - *larger sample*]
- The study measured the impact of forest elephants in Africa's rainforests, using measurements from the Congo Basin. [Correct]
- The study compared forest growth in Africa's and Asia's rainforests. [Incorrect - *larger sample*]
- The study compared the impact of different types of herbivores on forests. [Incorrect - *larger sample*]

3. Which statement is true?

- The study used a computer model to forecast the long-run impact of forest elephant loss. [Correct]
- The study used a computer model to project the behavior of forest elephants. [Incorrect]
- The study collected data on carbon emissions of forest elephants in Africa today. [Incorrect]
- The research used a computer model to compare current aboveground biomass with pre-colonization aboveground biomass in West Africa. [Incorrect]

4. Which statement is true? The authors conclude that...

- ...forest elephants should be expanded to other continents to fight climate change. [Incorrect]
- ...forests in Asia should also be studied to better understand their carbon emissions. [Incorrect]
- ...forest elephants should receive more protection and expand to help fight climate change. [Correct]
- ...other species' impact on forests, such as primates and birds, should be further studied to help fight climate change. [Incorrect]

## C Sender Behavior: Additional Results

### C.1 Pre-registered Analyses

In the pre-registration of the Sender Experiment (#118480), the key outcome variables list were: the accuracy of each unit of information; the types of units of information; the number of words in the message; the number of units of information; the sentiment in each message; the punctuation and language use. The pre-registration then stated “We will test whether the messages written under the different treatments differ in the key dependent variables mentioned above. We will also conduct text analyses that examine whether certain words are predictive of treatment assignment, for each research article. If the messages created under both attention treatments do not lead to significant differences in the number, type and accuracy of units, we will merge them in the analysis.”

The pre-registered outcomes are shown in Figure 3 in the main text and the coefficients are displayed in the tables below. Table C.1 shows the results for the accuracy of each unit of information. Table C.2 shows the results for the types of units of information, and Table C.3 reports the number of words in the message, the number of units of information, the sentiment in each message, the punctuation and readability (as measure of language use).

As acknowledged in the main text, we deviate from the plan to merge the data for attention incentives when presenting the results from the Sender Experiment. The reason to separate the effects of Clickbait- and Viral-Incentives is to be consistent across the Sender and Receiver Experiments. In the Sender Experiment with the LLM as sender there are differences in the effects of Clickbait- and Viral-Incentives. In the Receiver Experiments when summaries are available, there are significant differences between Clickbait- and Viral-Incentives in knowledge about the findings and methods used. These differences motivate the separate presentation of the effects throughout the paper.

Table C.1: Incentive Effects on Accuracy

	(1)	(2)	(3)
	Accuracy of Units:		
	Accurate-In text	Inaccurate-In text	Not in text
Clickbait-Incentives	-0.610** (0.272) [0.028]	0.041 (0.067) [0.223]	0.615*** (0.183) [0.003]
Viral-Incentives	-0.825*** (0.290) [0.006]	0.011 (0.069) [0.413]	0.870*** (0.212) [0.001]
Constant	3.796*** (0.357)	0.531*** (0.112)	1.146*** (0.271)
Observations	595	595	595
Info-Incentives: Mean	4.284	0.346	0.837
Info-Incentives: SD	1.873	0.626	1.037

*Notes:* This table presents average marginal effects from linear regression on the accuracy of senders' summaries. The number of units classified as Accurate-In text, Inaccurate-In text, or Not in text is shown in columns (1)-(3). All regressions include fixed effects for each article, as well as characteristics of the sender (whether their profile indicated a female gender, an indicator if gender could not be ascertained, and whether they specialize in social media copy or research and summaries). Standard errors clustered at the sender level are reported in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ . Sharpened FDR  $q$ -values are computed using the Anderson (2008) two-stage BKY procedure, over all outcomes in the Table for a treatment, and shown in square brackets.

Table C.2: Incentive Effects on Summary Focus

	(1)	(2)	(3)	(4)	(5)
	Introduction	Number of Units in Category:			Call to action
		Method	Finding	Conclusion	
Clickbait-Incentives	0.409** (0.158) [0.057]	-0.175** (0.075) [0.057]	-0.207 (0.139) [0.077]	-0.053 (0.110) [0.210]	0.071** (0.035) [0.057]
Viral-Incentives	0.559*** (0.174) [0.005]	-0.217*** (0.065) [0.005]	-0.392** (0.153) [0.009]	0.003 (0.116) [0.245]	0.102*** (0.038) [0.009]
Constant	1.419*** (0.222)	0.447*** (0.085)	3.087*** (0.216)	0.664*** (0.149)	-0.143*** (0.055)
Observations	595	595	595	595	595
Info-Incentives: Mean	1.495	0.433	2.163	1.356	0.019
Info-Incentives: SD	1.216	0.633	1.078	1.067	0.138

*Notes:* This table presents average marginal effects from linear regression on the focus of the units in senders' summaries. The number of units classified as Introduction, Method, Finding, Conclusion, and Call to Action is shown in columns (1)-(5). All regressions include fixed effects for each article, as well as characteristics of the sender (whether their profile indicated a female gender, an indicator if gender could not be ascertained, and whether they specialize in social media copy or research and summaries). Standard errors clustered at the sender level are reported in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ . Sharpened FDR  $q$ -values are computed using the Anderson (2008) two-stage BKY procedure, over all outcomes in the Table for a treatment, and shown in square brackets.

Table C.3: Incentive Effects on Sender Style

	(1)	(2)	(3)	(4)	(5)
	Length	Number of units	Sentiment	Punctuation	Readability
Clickbait-Incentives	-7.334* (3.944) [0.070]	0.046 (0.219) [0.502]	-0.039 (0.069) [0.406]	0.334*** (0.064) [0.001]	6.695*** (2.004) [0.003]
Viral-Incentives	-13.275*** (4.227) [0.003]	0.055 (0.220) [0.192]	-0.124* (0.068) [0.037]	0.281*** (0.067) [0.001]	10.221*** (2.236) [0.001]
Constant	104.498*** (4.513)	5.474*** (0.245)	1.156*** (0.125)	0.079 (0.084)	30.336*** (2.712)
Observations	595	595	595	595	595
Info-Incentives: Mean	102.37	5.47	0.05	0.14	25.53
Info-Incentives: SD	26.60	1.60	1.00	0.35	14.52

*Notes:* This table displays the estimated average marginal effects from linear regressions on for length (number of words – column (1) – and number of units – column (2)), sentiment, punctuation and readability. Sentiment is the standardized sentiment score, column (3), punctuation is an indicator that takes value 1 if the summary uses question marks, exclamation marks, ellipses, hashtags or icons, column (4), and readability is measured as the Flesch reading ease score, column (5). All regressions include fixed effects for each article, as well as characteristics of the sender (whether their profile indicated a female gender, an indicator if gender could not be ascertained, and whether they specialize in social media copy or research and summaries). Standard errors clustered at the sender level are reported in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ . Sharpened FDR  $q$ -values are computed using the Anderson (2008) two-stage BKY procedure, over all outcomes in the Table for a treatment, and shown in square brackets.

Additionally, following the pre-registration, we examine the predictive power of certain words, for each article. We compute the Term Frequency–Inverse Document Frequency (TF-IDF) of words appearing in each summary, to establish the frequency of distinct words across summaries. We then predict, using rigorous lasso regressions, the treatment based on these frequencies.

For the article on cancer by Lee et al. (2019), the word “groundbreaking” and “levels” were selected as less likely to appear in the Info- and Click-Incentives treatment, respectively, while the word “discovery” was selected as more likely to appear and the name “Deaconess” less likely to appear in the Viral-Incentives treatment. For the article on cancer by Kim et al. (2019), the word “growth” was selected as less likely to appear in the Info-Incentives treatment, while the words “eat” and “lots” were selected as more (less) likely to appear in the Viral-Incentives (Clickbait-Incentives) treatment.

For the article on sleep by Perrault et al. (2019), the word “health” was selected as more likely to appear in the Viral-Incentives treatment, while no words were selected to predict Info- or Clickbait-Incentives. For the article on sleep and diets by Gangwisch et al. (2020), the words “night” and “treatments” were selected as less likely to appear in the Info- and Clickbait-Incentives treatment, respectively, while the words “nights” and “disorder” were selected as more likely to appear in the Viral-Incentives treatment.

For the article on vaccines by Mina et al. (2019), the word “previous” was less likely to appear in the Viral-Incentives treatment, while no words were selected to predict Info- or Clickbait-Incentives. For the article by Hviid et al. (2019), the word “crucial” was selected as less likely to appear in the Info-Incentives treatment. The word “studies” was more likely and the word “tripling” less likely to appear in the Clickbait-Incentives treatment. By contrast, the word “tripling” was selected as more likely to appear and the words “sibling” and “childhood” were less likely to appear in the Viral-Incentives treatment.

For the climate article by Maxwell et al. (2019), the word “action” was less likely to appear in the Info-Incentives treatment, while the word “call” was selected as more likely to appear in the Viral-Incentive treatment. Finally, for the article by Berzaghi et al. (2019), the word “density” was selected to appear more often under Info-Incentives, while the names “Congo” and “France” were selected as less likely to appear in the Viral- and Clickbait-Incentives treatments, respectively.

In what follows in Online Appendix C, we report additional analyses that were not pre-registered and explore the data from the Sender Experiment, in further detail.

## C.2 Sender Incentives & Punctuation

We examine detailed punctuation use in each treatment in the following tables. Tables C.4 and C.5 present two measures of the effect of incentives on senders' punctuation use. Table C.4 shows the incentive effects on whether an exclamation mark, question mark, ellipsis, hashtag and icon were used at least once. Table C.5 shows the incentive effects on the number of times an exclamation mark, question mark, ellipsis, hashtag and icon were used within a summary.

Table C.4: Incentive Effects on Punctuation: Indicator Variables

	(1)	(2)	(3)	(4)	(5)
	Exclamation M.	Question M.	Ellipsis	Hashtag	Icon
Clickbait-Incentives	0.231*** (0.051)	0.156*** (0.045)	0.002 (0.009)	-0.015 (0.045)	0.043 (0.030)
Viral-Incentives	0.227*** (0.054)	0.141*** (0.043)	0.015 (0.015)	0.073 (0.057)	0.035 (0.028)
Constant	0.059 (0.072)	0.090 (0.070)	0.003 (0.024)	-0.101* (0.053)	-0.073* (0.041)
Observations	595	595	595	595	595
Info-Incentives: Mean	0.048	0.067	0.005	0.058	0.005
Info-Incentives: SD	0.214	0.251	0.069	0.234	0.069

*Notes:* This table presents average marginal effects from linear regression on the likelihood that each punctuation mark or icon listed is used at least once by the sender: exclamation mark (column (1)), question mark (column (2)), ellipsis (column (3)), hashtag (column (4)), icon (column(5)). All regressions include fixed effects for each article, as well as characteristics of the sender (whether their profile indicated a female gender, an indicator if gender could not be ascertained, and whether they specialize in social media copy or research and summaries). Standard errors clustered at the sender level are reported in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01.

Table C.5: Incentive Effects on Punctuation: Count Use Instances

	(1)	(2)	(3)	(4)	(5)
	Exclamation M.	Question M.	Ellipsis	Hashtag	Icon
Clickbait-Incentives	0.356*** (0.101)	0.171*** (0.057)	0.002 (0.015)	-0.243 (0.272)	0.147 (0.107)
Viral-Incentives	0.373*** (0.101)	0.168*** (0.062)	0.009 (0.017)	0.037 (0.291)	0.151 (0.123)
Constant	-0.087 (0.155)	0.117 (0.085)	0.012 (0.034)	-0.135 (0.209)	-0.297 (0.199)
Observations	595	595	595	595	595
Info-Incentives: Mean	0.067	0.087	0.010	0.312	0.010
Info-Incentives: SD	0.334	0.344	0.139	1.672	0.139

*Notes:* This table presents average marginal effects from linear regression on the number of times that each punctuation mark or icon listed is used by the sender: exclamation mark (column (1)), question mark (column (2)), ellipsis (column (3)), hashtag (column (4)), icon (column (5)). All regressions include fixed effects for each article, as well as characteristics of the sender (whether their profile indicated a female gender, an indicator if gender could not be ascertained, and whether they specialize in social media copy or research and summaries). Standard errors clustered at the sender level are reported in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01.

## C.3 Sender Incentives & Reporting of Sample and Implications

### C.3.1 Variables and Coding

**Research Sample.** First, the variable ‘sample reported’ captures whether the sender provided any sample information in the summary. Then we build several variables to determine how the sample was reported. We create two categories for sample reporting based on the sample origin and the sample size. Specifically, senders could mention the sample origin (group) vaguely or incorrectly, and they could mention the sample size vaguely or precisely. How each variable is defined, depending on the specifics of the research study, is detailed below:

- In research article 1 (Kim et al., 2019), the sample is the Nurses Health Study ( $N = 121,700$ ) and the Health Professionals Follow-Up Study ( $N = 51,529$ ). The sample origin is vague if it does not mention the two studies specifically, and only mentions two long-term observational studies. The sample size is vague if it is not mentioned, and it is incorrect if it reports a number that is different from those reported here or “over 170,000.”
- In research article 2 (Lee et al., 2019), the sample is cancer-prone mice and human cells. There are no instances in which the sample is mentioned and it is vague, as the presence of lab animals or mice is always mentioned. The sample size is not reported in the materials to the sender.
- In research article 3 (Gangwisch et al., 2020), the sample is  $N = 53,069$  postmenopausal women. The sample origin is considered vague if the summary only mentions female participants. It is considered incorrect if it mentions postmenstrual women or postpartum women. The sample size is vague if the summary does not mention the number of women, and only refers to the sample as postmenopausal women. There are no instances in which the sample size reported is incorrect.
- In research article 4 (Perrault et al., 2019), the sample is 18 healthy young adults. If the summary only mentions volunteers or participants, the sample origin is considered vague. If the summary mentions sleepers as the sample, it is considered incorrect. There are no instances where the sample size reported is vague or incorrect.
- In research article 5 (Mina et al., 2019), the sample is 77 unvaccinated children in a community in the Netherlands. There are no instances in which the sample origin is reported and it is vague or incorrect. The sample size is vague if the summary does not mention that there were 77 unvaccinated children.
- In research article 6 (Hviid et al., 2019), the sample is the Danish population of children born between 1999 and 2010 ( $N = 657,461$ ). The sample size is incorrect if it does not report the precise number or states it is over “600,000.” The sample origin is vague if it does not mention the data is from Denmark or if it does not mention the years included in the study.

- In research article 7 (Maxwell et al., 2019), the sample is intact tropical forest loss from 2000 to 2013. The sample size is not mentioned in the materials provided to the sender. The sample origin is vague if it does not mention the years included in the study.
- In research article 8 (Berzaghi et al., 2019), the sample is field measurements in the Congo Basin. The sample size is not mentioned in the materials provided to the sender. The sample origin is considered vague if it only mentions Africa, and not the Congo Basin.

**Research Implications.** First, we code whether the senders report the research as being directly relevant to the readers’ life by directly addressing them: “you will learn how to sleep better.” For that reason, we create the variable “direct appeal,” which is an indicator variable that takes value one if the summary has at least one mention of “you,” “your,” or “yourself,” and zero otherwise.

Additionally, we code whether the summary includes statements that derive the broader implications of the research and their accuracy. This coding was done manually with two research assistants blind to treatment assignment. The coding was done independently and then discussed until an agreement was reached. Two variables were coded based on whether the summary included an implication and whether the implication was correct (“incorrect implication”). The variable “incorrect implication” is an indicator variable that takes value one if the summary reports an incorrect broader implication, and zero otherwise. The coding was based on the materials provided to senders, focusing on whether the press release contained the implication (then it was correct) or it did not (then it was incorrect).

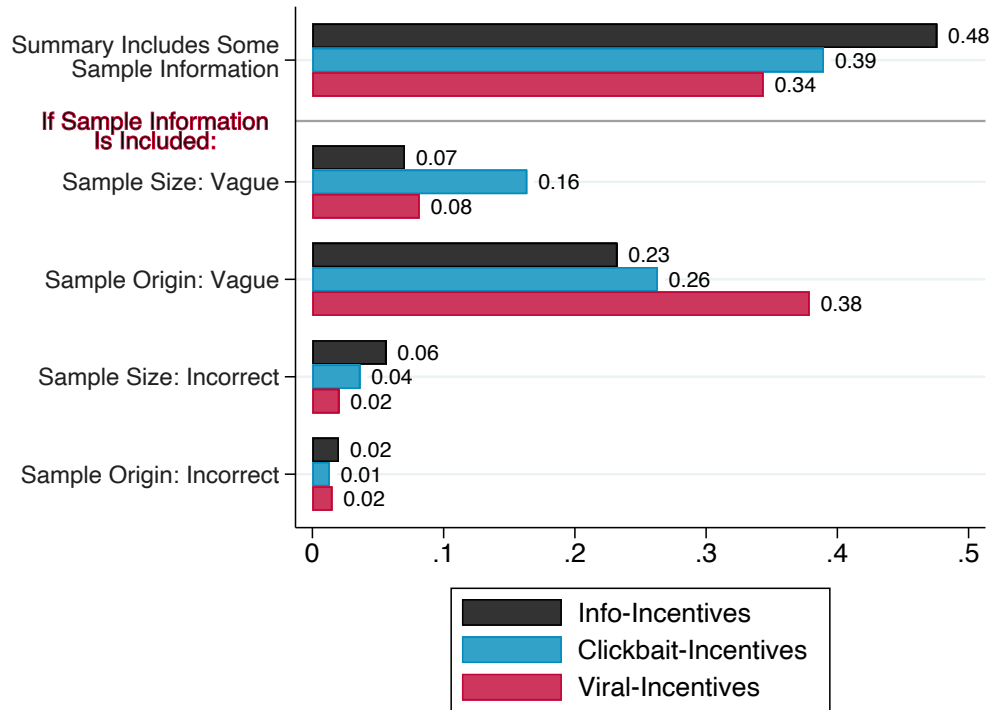
### C.3.2 Results

We first examine the likelihood with which the sender reports sample information. The results indicate that 48% of senders report the sample size under Information incentives, 39% report it under Clickbait-Incentives, and 34% report it under Viral-Incentives. Figure C.1 shows the average results and Table C.6, column (1), shows the estimated marginal effects of the sender’s incentive. On average, the likelihood of reporting the sample decreases with Viral-Incentives, at a marginally significant level ( $q$ -value= 0.054).

Additionally, Figure C.1 and Table C.6 show that, if the sample is reported, it is rarely reported incorrectly. It is more likely to be reported in a vague manner, and Viral incentives lead to a significant increase in the likelihood that the sample origin, i.e., the exact group of participants involved in the research, is reported vaguely.

Table C.6 also shows that direct appeals to the reader increase significantly with Clickbait- and Viral-Incentives. Incorrect implications are not significantly more likely with Clickbait-Incentives, but there is a significant increase with Viral-Incentives. Sender summaries are similarly likely to report any implication (77% with Info-Incentives, 81% with Clickbait- and Viral-Incentives), but those that report an implication are more likely to be incorrect when written with Viral-Incentives (56% with Info-Incentives, 58% with Clickbait-Incentives, and 67% with Viral-Incentives).

Figure C.1: Sample Information in Summaries, by Sender Incentives



*Notes:* This figure shows the type of reporting on the sample done by senders in summaries, by treatment. The figure first reports “Summary Includes Some Sample Information, ” which is defined as at least one unit of information in the summary is classified as describing the sample. The figure then conditions on summaries for which some sample information is included and classifies whether the information provided was (a) sample size reported vaguely, (b) sample origin reported vaguely, (c) sample size reported incorrectly, and (d) sample origin reported incorrectly. One summary could be counted in several of these categories.

Table C.6: Incentive Effects on Sample Reporting and Reporting of Implications

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
		If Sample Reported = 1:					
	Sample Reported	Sample Origin: Vague	Sample Origin: Incorrect	Sample size: Vague	Sample size: Incorrect	Direct appeal	Incorrect implication
Clickbait-Incentives	-0.071 (0.058) [0.503]	0.055 (0.043) [0.503]	-0.004 (0.020) [0.640]	0.066 (0.050) [0.503]	0.004 (0.032) [0.640]	0.169*** (0.046) [0.003]	0.033 (0.053) [0.640]
Viral-Incentives	-0.120** (0.058) [0.054]	0.110** (0.042) [0.032]	-0.004 (0.022) [0.689]	0.015 (0.046) [0.689]	-0.001 (0.024) [0.689]	0.259*** (0.050) [0.001]	0.118** (0.057) [0.054]
Constant	0.336*** (0.071)	0.300** (0.123)	0.064 (0.063)	-0.038 (0.046)	0.012 (0.032)	0.382*** (0.073)	0.453*** (0.081)
Observations	595	241	241	175	175	595	595
Info-Incentives: Mean	0.476	0.111	0.010	0.028	0.022	0.154	0.293
Info-Incentives: SD	0.501	0.314	0.098	0.165	0.148	0.362	0.456
Research articles included:	8/8	8/8	8/8	5/8	5/8	8/8	8/8

*Notes:* This table presents average marginal effects from linear regression on the sample reporting by senders and the conveyance of research implications. The sample in columns (2)-(5) includes only those sender summaries which reported the sample (Sample reported = 1). The study population was reported in all summaries and therefore columns (4)-(5) include summaries of all research articles, conditional on the summary reporting sample information. Sample size was not provided to senders for 3 research articles (one on cancer, two on climate). Columns (4)-(5) include 5 out of 8 research articles in which the sample size was explicitly provided. Standard errors clustered at the sender level are reported in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ . Sharpened FDR  $q$ -values are computed using the Anderson (2008) two-stage BKY procedure over all outcomes in the Table within treatment and shown in square brackets.

## C.4 Knowledge Content in Summaries

In addition to assessing receivers’ ability to answer knowledge questions correctly (in the *Knowledge* experiments), we conduct exploratory analyses to examine whether summaries contain the information that clearly identifies the correct answer to the question. To this end, we use two kinds of coding: a research assistant (human coder) and GPT3.5. We provide the text of the summary (including its headline), and we provide the knowledge questions, identifying which are the correct and incorrect answer options. We also provide one example for each article to GPT. Since GPT and the human coder agree in 71% of the cases, consistent with differences in how strictly they applied the need to clearly identify the question answer in the summary, we analyze the data both jointly and separately. In Panel A of Table C.7 the data combine the coding sources, and assign a value of 0.5 (rather than 0 or 1) to the cases of disagreement. Panel B includes only cases in which the two sources agreed. Tables C.8 and C.9 show the results for each source separately.

Considering all knowledge questions, summaries written with Clickbait-Incentives and Viral-Incentives are less likely to clearly contain the correct answer to them. These differences across sender incentives appear consistently across the three tables.

Table C.7: Knowledge Provided in Summary - GPT & Human Coding

	Answer Available to Question About:			
	(1) Finding	(2) Sample	(3) Method	(4) Conclusion
Panel A-Combined				
Info-Incentives	0.86	0.28	0.31	0.62
Clickbait-Incentives	0.82	0.18	0.24	0.61
Viral-Incentives	0.78	0.17	0.22	0.60
Panel B-Agreed				
Info-Incentives	0.98	0.14	0.26	0.80
Clickbait-Incentives	0.94	0.11	0.19	0.72
Viral-Incentives	0.84	0.10	0.16	0.64

*Notes:* This table shows whether the summaries written by freelancers contained the information required to answer the knowledge questions. The coding of human and GPT is used. In Panel A, the variable Answer Available takes value 1 if both GPT and the human agree that the correct answer option to the knowledge question could be *clearly* identified in the summary, and 0 if both agree that it cannot be clearly identified. The variable takes value 0.5 if GPT and the human disagree. In Panel B, only cases in which both sources agree are included..

Table C.8: Knowledge Provided in Summary - Human Coding

	Answer Available to Question About:			
	(1) Finding	(2) Sample	(3) Method	(4) Conclusion
Info-Incentives	0.78	0.37	0.28	0.57
Clickbait-Incentives	0.71	0.22	0.22	0.54
Viral-Incentives	0.72	0.22	0.19	0.57

*Notes:* This table shows whether the summaries written by freelancers contained the information required to answer the knowledge questions. The coding was done by comparing each summary to the four knowledge questions about the research with information about which ones were correct and which ones were incorrect. The variable Answer Available takes value 1 if the correct answer option to the knowledge question could be *clearly* identified in the summary, and 0 otherwise. The coder was a human research assistant.  $N = 595$  summaries.

Table C.9: Knowledge Provided in Summary - GPT Coding

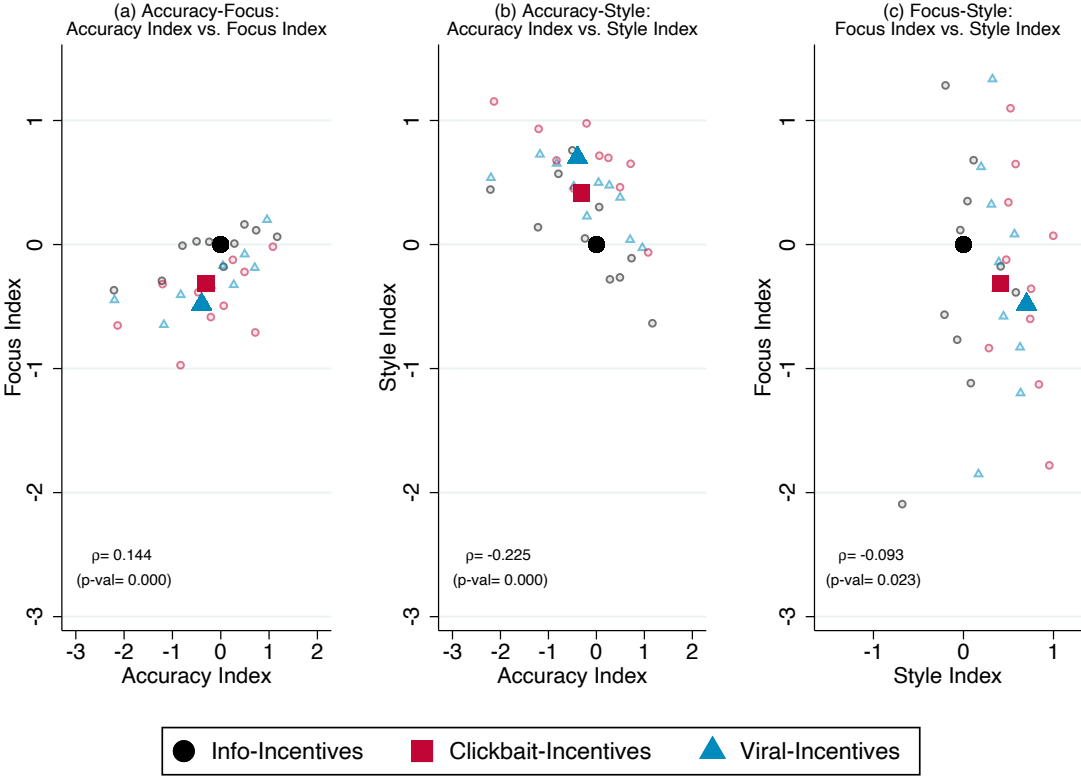
	Answer Available to Question About:			
	(1) Finding	(2) Sample	(3) Method	(4) Conclusion
Info-Incentives	0.94	0.18	0.35	0.68
Clickbait-Incentives	0.92	0.14	0.26	0.67
Viral-Incentives	0.85	0.12	0.26	0.62

*Notes:* This table shows whether the summaries written by freelancers contained the information required to answer the knowledge questions. The coding was done by comparing each summary to the four knowledge questions about the research with information about which ones were correct and which ones were incorrect. The variable Answer Available takes value 1 if the correct answer option to the knowledge question could be *clearly* identified in the summary, and 0 otherwise. The coding was done by GPT3.5.

## C.5 Summary-Level Tradeoffs and Heterogeneity

Clickbait- and Viral-Incentives change senders’ messages across three dimensions: style, focus, and accuracy. These changes could be a manifestation of all three dimensions changing simultaneously within a message, or the result of a heterogeneous response to incentives across messages. We explore this heterogeneity by examining the correlation between message dimensions. Figure C.2 shows that increases in accuracy are not strongly correlated with changes in focus and in style (between -0.01 and 0.08 correlation coefficient). By contrast, there is a strong relationship between focus and style (-0.2 correlation coefficient), suggesting that individuals use more readable sentences and punctuation to call attention when introducing the topic and drawing conclusions.

Figure C.2: Summary-Level Accuracy, Content and Style Tradeoffs



Notes: Each panel uses binscatter plots (20th percentiles), by sender incentive, to show the relationship between the variables. Panel (a) of this figure shows the distribution of summaries according to their accuracy and their focus indices. Panel (b) according to their accuracy and style indices, and Panel (c) according to their focus and style indices. The light markers correspond to each 20th percentile of the distribution. The average values are indicated with three dark markers (black circle for Info Incentives, red square for Clickbait-Incentives, and blue triangle for Viral-Incentives). Each panel also shows the correlation coefficient between the two variables ( $\rho$ ) and its  $p$ -value.

The results show that accuracy is not strongly at odds with content or style. Summaries that reflect the research more accurately do not focus less on motivating and drawing implications from the research and do not exhibit a significantly different writing style.

## D Online Attention to Research Articles

### D.1 Data and Coding

Altmetric is an online platform that tracks, collects, and measures how scholarly articles are discussed and shared online (Adie and Roe, 2013). Out of the 8 articles used in the experiments, 7 had Altmetric pages.

Altmetric tracks whether a research article appears in news articles, blogs or is mentioned on Twitter. Additionally, Altmetric collects several statistics on the articles, presented on a summary page. A main summary statistic is the Altmetric attention score, which is based on an automated algorithm that has weighted counts for different types of attention received by the article. The summary page also includes information on the demographics of those mentioning the article. Among others, it tracks whether those commenting are members of the public, scientists, science communicators or practitioners. On average, for the articles in the Sender experiment, online attention came from members of the public in 81% of the cases, from scientists in 11% of the cases, from science communicators in 2% of the cases, and from practitioners in 6% of the cases.

We scraped the data for the 7 articles with Altmetric pages. We focused on online mentions that are in English. For news and blogs, we scraped the headline and subtitle. There are 709 news links and 95 blogs with unique headlines (some websites, such as those belonging to public radio stations, post the same article several times). For tweets, we scraped the tweets that mention the research article as listed by Altmetric. There is significant variance in the type of tweets. We exclude tweets that are retweets of others and tweets that copy the title of the research article. Tweets that have more than 5 “@” typically have a list of several mentions without a clear headline, and we exclude them. We focus on 2269 tweets that fulfill these criteria.

We code the features of news and blog headlines, as well as tweets, in the following way. For accuracy and focus, we use GPT3.5. Via its API, we provide GPT with the sender materials, and ask it to classify each headline according to the accuracy and focus categories, relative to the materials for each article. We check the coding of GPT by comparing it to the coding of a research assistant, for news headlines. The coding coincides in 83% of the accuracy categorizations, and in 80% of the focus categorizations. For writing style, we employ the same measures as with sender summaries (length, readability, sentiment and punctuation).

For the comparison of sender writing and online writing, we focus throughout on headlines.

### D.2 Findings

Figure 4 in the main text compares the accuracy, focus, and style of headlines written by senders and found online, occurring naturally from individuals’ discussions and reporting of the research. The average values displayed in Figure 4 are shown in Tables D.1 and D.2.

Table D.1: Online and Sender Headlines: Accuracy and Focus

	(1)	(2)	(3)	(4)	(5)
	Accurate-In text	Inaccurate-In text	Not in Text	Introduction	Finding
Info-Incentives	0.649 (0.044)	0.077 (0.019)	0.274 (0.043)	0.721 (0.044)	0.279 (0.044)
Clickbait-Incentives	0.441 (0.048)	0.062 (0.015)	0.497 (0.051)	0.836 (0.027)	0.164 (0.027)
Viral-Incentives	0.443 (0.046)	0.052 (0.015)	0.505 (0.048)	0.880 (0.028)	0.120 (0.028)
Online news	0.597 (0.020)	0.007 (0.008)	0.396 (0.020)	0.684 (0.019)	0.307 (0.017)
Online blogs	0.495 (0.048)	0.000 (0.019)	0.505 (0.049)	0.705 (0.047)	0.263 (0.042)
Tweets	0.307 (0.010)	0.045 (0.004)	0.649 (0.010)	0.701 (0.010)	0.200 (0.009)

*Notes:* This table displays the fraction of headlines that are classified as Accurate-In text, Inaccurate-In text, or Not in text, for columns (1)-(3), and the fraction of headlines classified as Introduction or Finding, for columns (4)-(5). The data for Info-, Clickbait- and Viral-Incentives stems from the Sender Experiment (N=595), while the data for News, Blogs and Tweets, stems from Altmetric (N=2925). News exclude 148 generic headlines that only state 'News Story from [source]', with different sources mentioned.

Table D.2: Online and Sender Headlines: Writing Style

	(1)	(2)	(3)	(4)
	Length	Readability	Punctuation	Sentiment
Info-Incentives	14.654 (0.851)	34.708 (2.533)	0.096 (0.030)	-0.023 (0.017)
Clickbait-Incentives	15.390 (0.902)	47.661 (2.318)	0.415 (0.062)	0.017 (0.025)
Viral-Incentives	13.714 (0.867)	48.346 (2.598)	0.406 (0.070)	-0.014 (0.022)
Online news	10.734 (0.457)	49.351 (1.592)	0.077 (0.019)	-0.145 (0.010)
Online blogs	10.316 (1.110)	49.684 (3.870)	0.126 (0.045)	-0.120 (0.024)
Tweets	22.406 (0.227)	28.820 (0.792)	0.343 (0.009)	0.009 (0.005)

*Notes:* This table displays the average values of headline length (measured as the number of words, column (1)), readability (measured as the Flesch reading ease score, column (2)), punctuation (an indicator if the summary uses question marks, exclamation marks, ellipsis, hashtags or icons, column (3)), and sentiment (measured as the standardized sentiment score, column (4)). The data for Info-, Clickbait- and Viral-Incentives stems from the Sender Experiment (N=595), while the data for News, Blogs and Tweets, stems from Altmetric (N=2925). News exclude 148 generic headlines that only state 'News Story from [source]', with different sources mentioned.

Additionally, we leverage the data provided by Altmetric to compare the attention scores of each article to receivers' beliefs about sharing of the information about them online. Although these two data sources differ in an important number of dimensions, these comparisons can provide suggestive evidence into how receivers interpreted the belief elicitation about sharing.

We find that the 3 articles that were most tweeted about are on autism and the MMR vaccine (1,744 tweets), antibodies and the MMR vaccines (333), and vegetables and cancer (55).<sup>1</sup> In line with this, we find that the article that is most frequently selected in the sharing experiment, by receivers, as the most likely to be shared online, coincides with the article that received the highest number of tweets, on autism and the MMR vaccine (shared 28% of the time), followed by the article on vegetables and cancer (14%) and rocking beds (13%, not tracked by Altmetric).<sup>2</sup> Though the rankings do not fully coincide, they show significant similarities, which is suggestive that receivers' beliefs were consistent with actual online sharing (on Twitter).

---

<sup>1</sup>The tweets for emissions from deforestation (55), the impact of forest elephants (33), vitamin A and skin cancer (32), and high GI and insomnia (20).

<sup>2</sup>The sharing rates for the remaining articles were: for high GI and insomnia (12%), antibodies and the MMR vaccine (10%), vitamin A and skin cancer (10%), emissions from deforestation (8%) and the impact of forest elephants (7%).

## E Receiver Behavior: Additional Results

We initially pre-registered individual studies to measure knowledge after exposure to summaries—#126292—, click rates and knowledge before and after receiving materials—#128234—, and sharing—#134042. We later added a wave of data collection, which included all outcomes, with and without summaries available, to measure recall—#170901—. We stated that we “will pool this data together with the data collected in pre-reg #126292, #128234, and #134042.” In what follows, we provide the analyses based on the pre-registrations of the individual studies, pooling the data in for the later study. We also include additional exploratory analyses.

### E.1 Receiver Knowledge When Exposed to Summaries

The tables in this section examine the likelihood that receivers answer knowledge questions correctly in the Knowledge, Knowledge-Recall, Click-Knowledge and Click-Knowledge-Recall experiments, when they were only exposed to summaries. The regressions are conducted at the question level, complementing the analysis in Table 2 at the summary level.

#### E.1.1 Pre-registered Analyses

The pre-registration stated (#126292): “The key dependent variables are: the fraction of correct responses to multiple choice questions, and the type of errors that participants make.” Then, the pre-registration specified “We will test: whether accuracy varies by sender incentives, including and excluding controls for the characteristics of the summary. We will divide the analyses by topic and research article upon which the summaries are based, in addition to analyzing aggregate effects.” Table 2 in the main text shows the results excluding controls for the characteristics of the summary. In Online Appendix E.4, Table E.20 shows the results including characteristics of the summary—the indices for accuracy, focus, and style. Both tables show results at the summary level. The next analyses are conducted at the question level.

Table E.1 shows the findings by topic and research article. The bottom panel of the table presents  $F$ -tests for the null hypotheses that all interaction effects between Clickbait-Incentives or Viral-Incentives with topic or articles are zero. These null hypotheses cannot be rejected for Viral-Incentives. The null hypothesis for the interaction between Clickbait-Incentives and topics or articles is rejected when summaries are available, but not when they must be recalled.

The “type of errors that participants make” are shown in Figure 7 in the main text. Tables E.2, E.3 and E.4 provide further detail.

Under exploratory analyses we also wrote that “we will collect information on gender, age, education and social media use. We will measure the time individuals take to answer the questions. We plan to run exploratory analyses based on these participant’s characteristics/behaviors.” Table E.5 shows these results for the Knowledge experiment, with summaries available, and Table E.6 shows the results when summaries must be recalled. Table E.7 examines the impact of recall, pooling the knowledge in the Knowledge, Knowledge-Recall, and Click-Knowledge-Recall experiment (for those only exposed to summaries).

Table E.1: Receiver Knowledge - By Topic and Article

	(1) Likelihood of Correct Available	(2) Recall	(3) Answer, with Available	(4) Summary Recall
Clickbait-Incentives	-0.080*** (0.014)	-0.051*** (0.012)	-0.063*** (0.019)	-0.062*** (0.017)
Viral-Incentives	-0.085*** (0.014)	-0.042*** (0.011)	-0.063*** (0.020)	-0.045*** (0.017)
Cancer	0.044*** (0.013)	0.032*** (0.010)		
Vaccines	0.218*** (0.013)	0.227*** (0.010)		
Climate	0.162*** (0.013)	0.144*** (0.011)		
Clickbait-Incentives Summaries=1 × Cancer	0.051*** (0.018)	0.038** (0.015)		
Clickbait-Incentives Summaries=1 × Vaccines	0.014 (0.018)	0.020 (0.015)		
Clickbait-Incentives Summaries=1 × Climate	0.022 (0.018)	0.025 (0.016)		
Viral-Incentives Summaries=1 × Cancer	0.033* (0.018)	0.027* (0.015)		
Viral-Incentives Summaries=1 × Vaccines	0.021 (0.018)	0.015 (0.015)		
Viral-Incentives Summaries=1 × Climate	0.006 (0.017)	0.011 (0.015)		
Gangwisch et al. (2020)			0.140*** (0.017)	0.095*** (0.016)
Lee et al. (2019)			0.116*** (0.018)	0.113*** (0.015)
Kim et al. (2019)			0.113*** (0.019)	0.053*** (0.016)
Mina et al. (2019)			0.168*** (0.019)	0.175*** (0.014)
Hviid et al. (2019)			0.408*** (0.018)	0.375*** (0.015)
Maxwell et al. (2019)			0.175*** (0.019)	0.111*** (0.016)
Berzaghi et al. (2019)			0.290*** (0.018)	0.278*** (0.015)
Clickbait-Incentives Summaries=1 × Gangwisch et al. (2020)			-0.033 (0.024)	0.028 (0.022)
Clickbait-Incentives Summaries=1 × Lee et al. (2019)			0.020 (0.026)	0.062*** (0.023)
Clickbait-Incentives Summaries=1 × Kim et al. (2019)			0.048* (0.027)	0.036 (0.023)
Clickbait-Incentives Summaries=1 × Mina et al. (2019)			0.030 (0.025)	0.042** (0.022)
Clickbait-Incentives Summaries=1 × Hviid et al. (2019)			-0.034 (0.026)	0.027 (0.023)
Clickbait-Incentives Summaries=1 × Maxwell et al. (2019)			0.012 (0.026)	0.052** (0.023)
Clickbait-Incentives Summaries=1 × Berzaghi et al. (2019)			0.000 (0.026)	0.022 (0.023)
Viral-Incentives Summaries=1 × Gangwisch et al. (2020)			-0.043* (0.025)	0.012 (0.022)
Viral-Incentives Summaries=1 × Lee et al. (2019)			0.035 (0.026)	0.042* (0.022)
Viral-Incentives Summaries=1 × Kim et al. (2019)			-0.011 (0.027)	0.016 (0.023)
Viral-Incentives Summaries=1 × Mina et al. (2019)			-0.001 (0.026)	0.022 (0.021)
Viral-Incentives Summaries=1 × Hviid et al. (2019)			-0.001 (0.026)	0.029 (0.023)
Viral-Incentives Summaries=1 × Maxwell et al. (2019)			-0.019 (0.026)	0.021 (0.023)
Viral-Incentives Summaries=1 × Berzaghi et al. (2019)			-0.013 (0.026)	0.015 (0.023)
Constant	0.480*** (0.027)	0.419*** (0.020)	0.408*** (0.029)	0.365*** (0.022)
F-test All Topics=0, p-val	0.00	0.00		
F-test Clickbait-Incentives X All Topics=0, p-val	0.03	0.10		
F-test Viral-Incentives X All Topics=0, p-val	0.21	0.35		
F-test Articles=0, p-val			0.00	0.00
F-test Clickbait-Incentives X All Articles=0, p-val			0.00	0.21
F-test Viral-Incentives X All Articles=0, p-val			0.13	0.72
Observations	33,336	44,180	33,336	44,180
Nr. of receivers	1,043	1,545	1,043	1,545

Notes: This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment, the Knowledge Recall Experiment and the Click-Knowledge-Recall Experiment, if they were only exposed to summaries (did not click to read more). Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table E.2: Receiver Errors: Larger Sample

	(1)	(2)	(3)	(4)	(5)
	<b>Receiver Error Type in Sample Question</b>				
	Larger Sample				
Click Incentives	0.003 (0.016)	-0.008 (0.013)	-0.003 (0.010)	-0.004 (0.010)	-0.005 (0.008)
Viral Incentives	-0.006 (0.016)	0.010 (0.014)	0.004 (0.010)	0.003 (0.010)	-0.005 (0.008)
Summary Recall			0.052*** (0.008)	0.057*** (0.010)	0.068*** (0.008)
Female receiver				-0.009 (0.008)	-0.008 (0.007)
Age of receiver				-0.000 (0.000)	-0.000* (0.000)
Social media user				-0.031* (0.017)	-0.022* (0.013)
College education				0.010 (0.008)	0.013** (0.006)
Constant	0.339*** (0.012)	0.389*** (0.009)	0.337*** (0.009)	0.371*** (0.023)	0.616*** (0.022)
Observations	4,829	7,394	12,223	12,223	12,223
Summaries	Available	Recalled	Both	Both	Both
Article FE	No	No	No	No	Yes

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that receivers incorrectly answer a question about the sample of a research article and select an option answer that states a larger sample than the one used in the study. A detailed description for how each answer option is coded is provided in Online Appendix B.3. The last column includes article fixed effects. Clustered standard errors, at the receiver level, are shown in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table E.3: Receiver Errors: More Representative Sample

	(1)	(2)	(3)	(4)	(5)
	<b>Receiver Error Type in Sample Question</b>				
	More Representative				
Click Incentives	0.034*	0.023	0.028**	0.027**	0.025**
	(0.020)	(0.015)	(0.012)	(0.012)	(0.011)
Viral Incentives	0.021	0.030**	0.026**	0.026**	0.028**
	(0.019)	(0.015)	(0.012)	(0.012)	(0.011)
Summary Recall			-0.088***	-0.100***	-0.111***
			(0.010)	(0.013)	(0.012)
Female receiver				-0.008	-0.006
				(0.010)	(0.010)
Age of receiver				-0.000	-0.000
				(0.000)	(0.000)
Social media user				-0.003	-0.008
				(0.022)	(0.021)
College education				-0.023**	-0.019**
				(0.010)	(0.010)
Constant	0.472***	0.385***	0.472***	0.507***	0.413***
	(0.015)	(0.010)	(0.011)	(0.029)	(0.031)
Observations	4,054	6,185	10,239	10,239	10,239
Summaries	Available	Recalled	Both	Both	Both
Article FE	No	No	No	No	Yes

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that receivers incorrectly answer a question about the sample of a research article and select an answer that states a group being studied that is closer to a more group, defined as closer to a US adult. A detailed description for how each answer option is coded is provided in Online Appendix B.3. The last column includes article fixed effects. Clustered standard errors, at the receiver level, are shown in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table E.4: Receiver Errors: By Sample Information in Summary

	(1)	(2)	(3)	(4)
	<b>Receiver Error Type in Sample Question</b>			
	Larger Sample		More Representative Sample	
	Message Includes Some Sample Info?		Messages Includes Some Sample Info?	
	No	Yes	No	Yes
Clickbait-Incentives Summaries	-0.002 (0.010)	0.001 (0.010)	-0.009 (0.015)	0.046*** (0.017)
Viral Incentives	-0.003 (0.010)	-0.009 (0.011)	-0.014 (0.015)	0.062*** (0.018)
Summary Recall	0.054*** (0.011)	0.117*** (0.013)	-0.107*** (0.016)	-0.093*** (0.019)
Female receiver	-0.006 (0.009)	-0.014 (0.009)	-0.003 (0.012)	-0.016 (0.015)
Age of receiver	-0.001** (0.000)	0.000 (0.000)	0.001* (0.000)	-0.001*** (0.001)
Social media user	-0.025 (0.018)	-0.015 (0.019)	-0.045* (0.027)	0.060* (0.034)
College education	0.020** (0.008)	0.000 (0.009)	-0.030** (0.012)	0.000 (0.015)
Constant	0.658*** (0.028)	0.444*** (0.040)	0.444*** (0.039)	0.355*** (0.053)
Observations	8,037	4,186	6,486	3,753
Article FE	Yes	Yes	Yes	Yes

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that receivers incorrectly answer a question about the sample of a research article and select an option answer that states a larger sample than the one used in the study (column (1)) or that they selected an answer that states a group being studied that is closer to a more group, defined as closer to a US adult (column (2)). All regressions include article fixed effects. Clustered standard errors, at the sender level, are shown in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table E.5: Receiver Knowledge in Knowledge Experiment - Summary Available

	(1)	(2)	(3)	(4)	(5)
	<b>Likelihood of Correct Answer</b>				
Clickbait-Incentives Summary	-0.058*** (0.011)	-0.058*** (0.011)	-0.058*** (0.011)	-0.030*** (0.011)	-0.132** (0.057)
Viral-Incentives Summary	-0.071*** (0.011)	-0.070*** (0.011)	-0.070*** (0.011)	-0.045*** (0.011)	-0.183*** (0.059)
Female receiver		0.008 (0.009)	0.008 (0.009)	0.013 (0.009)	-0.009 (0.016)
Age of receiver		-0.000 (0.000)	-0.001 (0.000)	-0.000 (0.000)	-0.001 (0.001)
Social media user		-0.019 (0.019)	-0.019 (0.019)	-0.018 (0.018)	-0.075** (0.038)
College education		0.028*** (0.009)	0.028*** (0.009)	0.023*** (0.009)	0.018 (0.015)
Time spent		0.000*** (0.000)	0.000*** (0.000)	0.000** (0.000)	0.000* (0.000)
Answer Available in Summary				0.323*** (0.006)	0.322*** (0.006)
Clickbait-Incentives Summaries X Female					0.044** (0.022)
Clickbait-Incentives Summaries X Age					0.001 (0.001)
Clickbait-Incentives Summaries X College					0.001 (0.021)
Clickbait-Incentives Summaries X Social media					0.063 (0.044)
Viral-Incentives Summaries X Female					0.022 (0.022)
Viral-Incentives Summaries X Age					0.001 (0.001)
Viral-Incentives Summaries X College					0.014 (0.021)
Viral-Incentives Summaries X Social media					0.080* (0.048)
Constant	0.571*** (0.008)	0.586*** (0.026)	0.427*** (0.028)	0.256*** (0.026)	0.345*** (0.048)
Receiver characteristics	No	Yes	Yes	Yes	Yes
Research Article and Order FE	No	No	Yes	Yes	Yes
Observations	33,336	33,336	33,336	33,336	33,336
Nr. of receivers	1,043	1,043	1,043	1,043	1,043
Mean Correct with Info-Incentives Summaries	0.57	0.59	0.43	0.26	0.35
Mean correct with Clickbait-Incentives	0.51	0.53	0.37	0.23	0.21
Mean Correct with Viral-Incentives Summaries	0.50	0.52	0.36	0.21	0.16

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment. Receivers had the summary available when answering the questions. Each receiver answered 32 questions, 4 for each research study (10 receivers saw a repeated summary, they thus have 28 unique responses). The regressions pool all questions together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, and that they have at least a 4-year college education, the wave of data collection, and the time spent answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table E.6: Receiver Knowledge in Knowledge Experiment - Summary Recall

	(1)	(2)	(3)	(4)	(5)
	<b>Likelihood of Correct Answer</b>				
Clickbait-Incentives Summary	-0.030*** (0.008)	-0.029*** (0.008)	-0.028*** (0.008)	-0.006 (0.008)	-0.058 (0.040)
Viral-Incentives Summary	-0.030*** (0.008)	-0.028*** (0.008)	-0.025*** (0.008)	-0.005 (0.008)	0.020 (0.039)
Female receiver		0.008 (0.008)	0.007 (0.008)	0.007 (0.007)	0.004 (0.011)
Age of receiver		-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)	-0.001*** (0.000)
Social media user		-0.015 (0.014)	-0.016 (0.014)	-0.016 (0.014)	-0.026 (0.026)
College education		0.035*** (0.007)	0.035*** (0.007)	0.034*** (0.007)	0.046*** (0.011)
Time spent		0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)	0.000*** (0.000)
Click-Knowledge-Recall Experiment		0.006 (0.008)	-0.002 (0.007)	-0.003 (0.007)	-0.004 (0.007)
Answer Available in Summary				0.252*** (0.005)	0.252*** (0.005)
Clickbait-Incentives Summaries X Female					-0.005 (0.016)
Clickbait-Incentives Summaries X Age					0.001 (0.001)
Clickbait-Incentives Summaries X College					-0.014 (0.016)
Clickbait-Incentives Summaries X Social media					0.045 (0.031)
Viral-Incentives Summaries X Female					0.018 (0.016)
Viral-Incentives Summaries X Age					-0.000 (0.001)
Viral-Incentives Summaries X College					-0.027* (0.016)
Viral-Incentives Summaries X Social media					-0.003 (0.032)
Constant	0.500*** (0.006)	0.519*** (0.020)	0.351*** (0.022)	0.215*** (0.022)	0.220*** (0.031)
Receiver characteristics	No	Yes	Yes	Yes	Yes
Research Article and Order FE	No	No	Yes	Yes	Yes
Observations	44,180	44,180	44,180	44,180	44,180
Nr. of receivers	1,545	1,545	1,545	1,545	1,545
Mean Correct with Info-Incentives Summaries	0.50	0.52	0.35	0.21	0.22
Mean correct with Clickbait-Incentives	0.47	0.49	0.32	0.21	0.16
Mean Correct with Viral-Incentives Summaries	0.47	0.49	0.33	0.21	0.24

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge-Recall Experiment and Click-Knowledge-Recall Experiment for summaries that receivers did not click on to read more about. Receivers did not have the summary available when answering the questions. The regressions pool all questions receivers answered together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, and that they have at least a 4-year college education, the wave of data collection, and the time spent answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table E.7: Receiver Knowledge - Impact of Recall

	(1)	(2)	(3)
	<b>Likelihood of Correct Answer</b>		
Summary Recall	-0.074*** (0.011)	-0.089*** (0.011)	-0.092*** (0.011)
Clickbait-Incentives Summary	-0.058*** (0.011)	-0.057*** (0.011)	-0.057*** (0.011)
Viral-Incentives Summary	-0.071*** (0.011)	-0.069*** (0.011)	-0.069*** (0.011)
Clickbait-Incentives Summary X Recall	0.029** (0.014)	0.029** (0.014)	0.029** (0.014)
Viral-Incentives Summary X Recall	0.042*** (0.014)	0.041*** (0.014)	0.044*** (0.014)
Summary Recall X Click-Knowledge-Recall Experiment	0.006 (0.008)	0.006 (0.008)	-0.002 (0.007)
Female receiver		0.008 (0.006)	0.008 (0.006)
Age of receiver		-0.001*** (0.000)	-0.001*** (0.000)
Social media user		-0.018 (0.012)	-0.018 (0.012)
College education		0.031*** (0.006)	0.031*** (0.006)
Time spent		0.000*** (0.000)	0.000*** (0.000)
Constant	0.571*** (0.008)	0.596*** (0.017)	0.433*** (0.018)
Receiver characteristics	No	Yes	Yes
Research Article and Order FE	No	No	Yes
Observations	77,516	77,516	77,516
Nr. of receivers	2,588	2,588	2,588
Correct with Info-Incentives Summaries Available	0.57	0.60	0.43
Correct with Clickbait-Incentives Summaries Available	0.51	0.54	0.38
Correct with Viral-Incentives Summaries Available	0.50	0.53	0.36
Correct with Info-Incentives Summary Recall	0.50	0.51	0.34
Correct with Clickbait-Incentives Summary Recall	0.47	0.48	0.31
Correct with Viral-Incentives Summary Recall	0.47	0.48	0.32

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment (columns (1) and (3)), or the Knowledge Recall Experiment and the Click-Knowledge-Recall Experiment, if they were only exposed to summaries (columns (2) and (4)). The regressions pool all questions receivers answered together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, and that they have at least a 4-year college education, the wave of data collection, and the time spent answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

### **E.1.2 Additional Analyses**

We explore differences in knowledge by the type of question that receivers answered (on the finding, the sample, the method or the conclusion of the research article) in Tables E.8 and E.9.

Table E.8: Receiver Knowledge in Knowledge Experiment - Summary Available

	(1)	(2)	(3)
	Likelihood of Correct Answer		
Clickbait-Incentives Summary	-0.030*	-0.030*	-0.030*
	(0.015)	(0.015)	(0.015)
Viral-Incentives Summary	-0.061***	-0.061***	-0.061***
	(0.016)	(0.016)	(0.016)
Sample Question	-0.126***	-0.126***	-0.126***
	(0.014)	(0.014)	(0.014)
Method Question	-0.130***	-0.130***	-0.130***
	(0.011)	(0.011)	(0.011)
Conclusion Question	-0.003	-0.003	-0.003
	(0.012)	(0.012)	(0.012)
Clickbait-Incentives Summary X Sample Question	-0.103***	-0.103***	-0.103***
	(0.018)	(0.018)	(0.018)
Clickbait-Incentives Summary X Method Question	-0.005	-0.005	-0.005
	(0.016)	(0.016)	(0.016)
Clickbait-Incentives Summary X Conclusion Question	-0.005	-0.005	-0.005
	(0.017)	(0.017)	(0.017)
Viral-Incentives Summary X Sample Question	-0.074***	-0.074***	-0.074***
	(0.019)	(0.019)	(0.019)
Viral-Incentives Summary X Method Question	-0.005	-0.005	-0.005
	(0.016)	(0.016)	(0.016)
Viral-Incentives Summary X Conclusion Question	0.037**	0.037**	0.037**
	(0.017)	(0.017)	(0.017)
Constant	0.636***	0.656***	0.504***
	(0.011)	(0.027)	(0.028)
Receiver characteristics	No	Yes	Yes
Research Article and Order FE	No	No	Yes
Observations	33,336	33,336	33,336
Nr. of receivers	1,043	1,043	1,043
Finding Question Correct with Info-Incentives	0.64	0.66	0.50
Finding Question Correct with Clickbait-Incentives	0.61	0.63	0.47
Finding Question Correct with Viral-Incentives	0.58	0.60	0.44
Sample Question Correct with Info-Incentives	0.51	0.53	0.38
Sample Question Correct with Clickbait-Incentives	0.38	0.40	0.25
Sample Question Correct with Viral-Incentives	0.38	0.40	0.24
Method Question Correct with Info-Incentives	0.51	0.53	0.37
Method Question Correct with Clickbait-Incentives	0.47	0.49	0.34
Method Question Correct with Viral-Incentives	0.44	0.46	0.31
Conclusion Question Correct with Info-Incentives	0.63	0.65	0.50
Conclusion Question Correct with Clickbait-Incentives	0.60	0.62	0.47
Conclusion Question Correct with Viral-Incentives	0.61	0.63	0.48

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment. Receivers had the summary available when answering the questions. The regression includes indicator variables for the type of question (Sample, Method, Conclusion, where Finding is the omitted category) and interacts the type of question with the sender's incentive in the Sender Experiment. Each receiver answered 32 questions, 4 for each research study (10 receivers saw a repeated summary, they thus have 28 unique responses). The regressions pool all questions together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, and that they have at least a 4-year college education, the wave of data collection, and the time spent answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table E.9: Receiver Knowledge in Knowledge Experiment - Summary Recall

	(1)	(2)	(3)
	<b>Likelihood of Correct Answer</b>		
Clickbait-Incentives Summary	-0.014 (0.013)	-0.013 (0.013)	-0.012 (0.013)
Viral-Incentives Summary	-0.038*** (0.013)	-0.039*** (0.013)	-0.034*** (0.012)
Sample Question	-0.231*** (0.010)	-0.231*** (0.010)	-0.231*** (0.010)
Method Question	-0.149*** (0.010)	-0.149*** (0.010)	-0.149*** (0.010)
Conclusion Question	0.015 (0.009)	0.015 (0.009)	0.015 (0.009)
Clickbait-Incentives Summary X Sample Question	-0.038** (0.015)	-0.038** (0.015)	-0.038** (0.015)
Clickbait-Incentives Summary X Method Question	-0.011 (0.015)	-0.011 (0.015)	-0.011 (0.015)
Clickbait-Incentives Summary X Conclusion Question	-0.013 (0.014)	-0.013 (0.014)	-0.013 (0.014)
Viral-Incentives Summary X Sample Question	-0.005 (0.015)	-0.005 (0.015)	-0.005 (0.015)
Viral-Incentives Summary X Method Question	0.005 (0.015)	0.005 (0.015)	0.005 (0.015)
Viral-Incentives Summary X Conclusion Question	0.035** (0.014)	0.035** (0.014)	0.035** (0.014)
Constant	0.591*** (0.009)	0.628*** (0.020)	0.468*** (0.022)
Receiver characteristics	No	Yes	Yes
Research Article and Order FE	No	No	Yes
Observations	44,180	44,180	44,180
Nr. of receivers	1,545	1,545	1,545
Finding Question Correct with Info-Incentives	0.59	0.63	0.47
Finding Question Correct with Clickbait-Incentives	0.58	0.61	0.46
Finding Question Correct with Viral-Incentives	0.55	0.59	0.43
Sample Question Correct with Info-Incentives	0.36	0.40	0.24
Sample Question Correct with Clickbait-Incentives	0.31	0.35	0.19
Sample Question Correct with Viral-Incentives	0.32	0.35	0.20
Method Question Correct with Info-Incentives	0.44	0.48	0.32
Method Question Correct with Clickbait-Incentives	0.42	0.45	0.30
Method Question Correct with Viral-Incentives	0.41	0.45	0.29
Conclusion Question Correct with Info-Incentives	0.61	0.64	0.48
Conclusion Question Correct with Clickbait-Incentives	0.58	0.62	0.46
Conclusion Question Correct with Viral-Incentives	0.60	0.64	0.48

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge-Recall Experiment and Click-Knowledge-Recall Experiment for summaries that receivers did not click on to read more about. Receivers did not have the summary available when answering the questions. The regression includes indicator variables for the type of question (Sample, Method, Conclusion, where Finding is the omitted category) and interacts the type of question with the sender's incentive in the Sender Experiment. The regressions pool all questions receivers answered together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, and that they have at least a 4-year college education, the wave of data collection, and the time spent answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

## E.2 Receiver Clicks and Knowledge

The tables in this section examine the likelihood that receivers click to learn more about a research study.

### E.2.1 Pre-registered Analyses

The pre-registration stated (#128234): “The key dependent variables are: the number of summaries that individuals choose to read more about, and the incentive under which those summaries were created. Since participants also answer questions, another dependent variable is the fraction of correct answers, as well as the time taken to read each summary and complete the study.”

Then it stated “We will test: whether incentives to click or to share lead to more interest among readers than incentives to inform. We will divide the analyses by topic and research article upon which the summaries are based, in addition to analyzing aggregate effects. We will analyze which features of the summaries lead to more clicks and whether those are correctly anticipated by those sending the summaries.”

The results for click rates are shown in the main text, under Table 2. Since these results focus on the summary level, we include an additional table, Table E.10, showing the results at the receiver level, considering the eight possible summaries that they could click on.<sup>3</sup>

The results by topic and research article are shown in Table E.11. The bottom panel of the table presents  $F$ -tests for the null hypotheses that all interaction effects between Clickbait-Incentives or Viral-Incentives with topic or articles are zero. These null hypotheses cannot be rejected for the interaction between topics and Clickbait-Incentives or Viral-Incentives. The null hypothesis for the interaction between Viral-Incentives and the articles is marginally significant, suggesting that the incentive effects differed for some articles (see column (2)).

The results showing which features lead to more clicks are shown in Online Appendix E.4, Table E.20.

Additionally, we examine the fraction of correct answers after individuals click to read more, in Table 2 in the main text, and in further detail in Online Appendix E.2.2. Separately, time taken to read the summary was not collected, due to human error. Time spent reading the materials and answering knowledge questions after having clicked on the summary to read more was measured. It does not differ by whether the receiver was exposed to eight summaries written with Clickbait- and Info-Incentives, or Viral- and Info-Incentives. Time to complete the study does not differ across these two groups either.

---

<sup>3</sup>Exploratory analyses that extend Table E.10 by examining heterogeneity according to receiver characteristics (gender, age, college education, and social media use) do not reveal any interaction between these and their exposure to summaries written under Clickbait- or Viral-Incentives.

Table E.10: Determinants of Click Rate - Receiver-Level Results

	(1)	(2)	(3)	(4)	(5)	(6)
	<b>Likelihood Receiver Clicks to Read More</b>					
<i>Experiment:</i>	Click-Knowledge	Click-Knowledge	Click-Knowledge-Recall	Click-Knowledge-Recall	Both	Both
Clickbait-Incentives Summary	0.046*** (0.015)	0.045*** (0.015)	0.046*** (0.017)	0.047*** (0.017)	0.046*** (0.011)	0.046*** (0.011)
Viral-Incentives Summary	0.019 (0.016)	0.018 (0.016)	0.046*** (0.014)	0.044*** (0.014)	0.033*** (0.011)	0.031*** (0.011)
Condition with Viral- vs. Info-Inc Summaries	-0.004 (0.016)	-0.004 (0.016)	0.001 (0.017)	0.001 (0.017)	-0.001 (0.012)	-0.001 (0.012)
Female receiver		0.002 (0.012)		0.020 (0.014)		0.011 (0.009)
Age of receiver		-0.000 (0.000)		0.000 (0.001)		-0.000 (0.000)
Social media user		-0.032 (0.035)		-0.021 (0.028)		-0.026 (0.023)
College education		0.012 (0.012)		-0.003 (0.014)		0.004 (0.009)
Click-Knowledge Experiment					-0.035*** (0.009)	-0.049*** (0.010)
Constant	0.187*** (0.011)	0.246*** (0.044)	0.212*** (0.012)	0.211*** (0.038)	0.217*** (0.009)	0.254*** (0.029)
Receiver characteristics	No	No	No	No	No	No
Order FE	No	No	No	No	No	No
Observations	5,203	5,203	5,144	5,144	10,347	10,347
Nr. of receivers	651	651	643	643	1,294	1,294
Click rate on Info-Incentives Summaries	0.19	0.25	0.21	0.21	0.22	0.25
Click rate on Clickbait-Incentives	0.23	0.29	0.26	0.26	0.26	0.30
Click rate on Viral-Incentives Summaries	0.21	0.26	0.26	0.26	0.25	0.29

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver clicks to read more about a research article in the Click-Knowledge and Click-Knowledge-Recall Experiment. There were two conditions, one that combined Info-Inc Summaries and Clickbait-Inc Summaries and one that combined Info-Inc Summaries and Viral-Inc Summaries (*Condition with Viral- vs. Info-Inc Summaries*= 1). Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

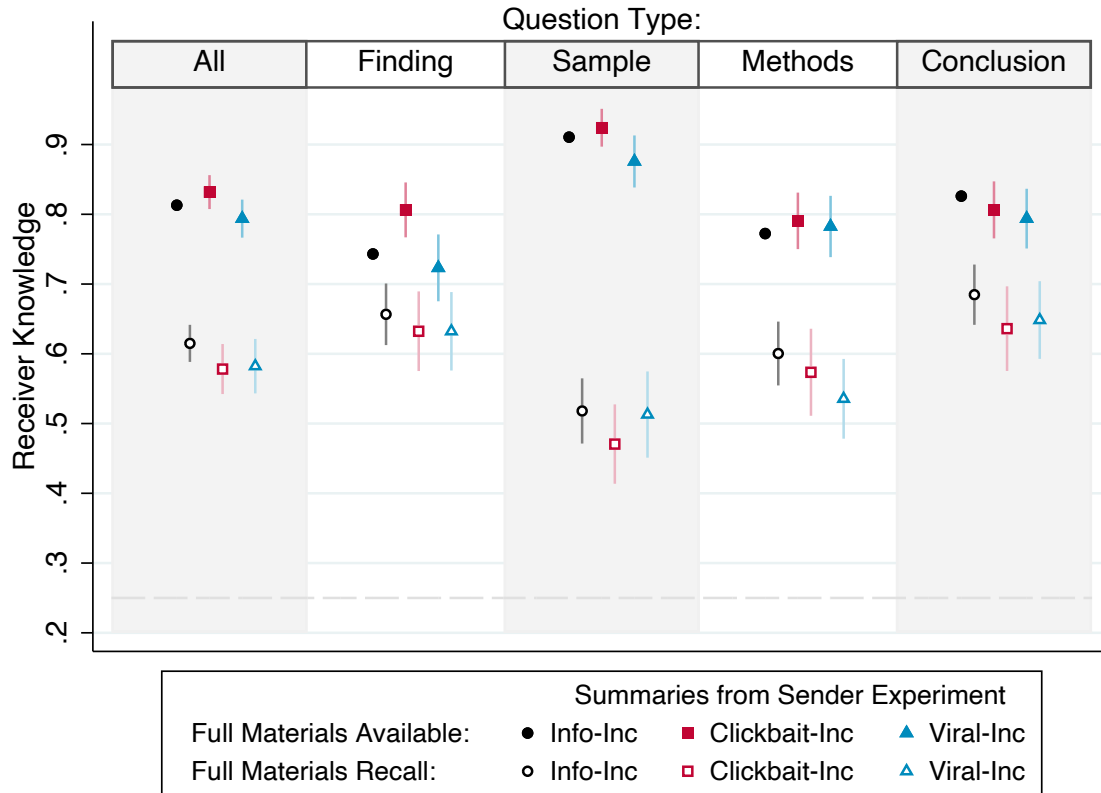
Table E.11: Receiver Click Rate - By Topic and Article

	(1)	(2)
	Likelihood	Receiver Clicks to Read More
Clickbait-Incentives	0.052** (0.024)	0.015 (0.035)
Viral-Incentives	0.011 (0.023)	-0.006 (0.033)
Cancer	-0.131*** (0.016)	
Vaccines	-0.193*** (0.015)	
Climate	-0.149*** (0.017)	
Clickbait-Incentives Summaries=1 × Cancer	0.028 (0.030)	
Clickbait-Incentives Summaries=1 × Vaccines	-0.021 (0.029)	
Clickbait-Incentives Summaries=1 × Climate	-0.031 (0.029)	
Viral-Incentives Summaries=1 × Cancer	0.037 (0.028)	
Viral-Incentives Summaries=1 × Vaccines	0.009 (0.027)	
Viral-Incentives Summaries=1 × Climate	0.034 (0.029)	
Gangwisch et al. (2020)		-0.155*** (0.025)
Lee et al. (2019)		-0.197*** (0.024)
Kim et al. (2019)		-0.220*** (0.024)
Mina et al. (2019)		-0.276*** (0.023)
Hviid et al. (2019)		-0.267*** (0.023)
Maxwell et al. (2019)		-0.248*** (0.024)
Berzaghi et al. (2019)		-0.207*** (0.025)
Clickbait-Incentives Summaries=1 × Gangwisch et al. (2020)		0.075 (0.047)
Clickbait-Incentives Summaries=1 × Lee et al. (2019)		0.087* (0.046)
Clickbait-Incentives Summaries=1 × Kim et al. (2019)		0.045 (0.045)
Clickbait-Incentives Summaries=1 × Mina et al. (2019)		-0.004 (0.042)
Clickbait-Incentives Summaries=1 × Hviid et al. (2019)		0.037 (0.042)
Clickbait-Incentives Summaries=1 × Maxwell et al. (2019)		-0.020 (0.041)
Clickbait-Incentives Summaries=1 × Berzaghi et al. (2019)		0.034 (0.044)
Viral-Incentives Summaries=1 × Gangwisch et al. (2020)		0.027 (0.044)
Viral-Incentives Summaries=1 × Lee et al. (2019)		0.076* (0.044)
Viral-Incentives Summaries=1 × Kim et al. (2019)		0.031 (0.042)
Viral-Incentives Summaries=1 × Mina et al. (2019)		-0.002 (0.040)
Viral-Incentives Summaries=1 × Hviid et al. (2019)		0.058 (0.042)
Viral-Incentives Summaries=1 × Maxwell et al. (2019)		0.005 (0.041)
Viral-Incentives Summaries=1 × Berzaghi et al. (2019)		0.104** (0.043)
Condition with Viral- vs. Info-Inc Summaries	-0.002 (0.012)	-0.002 (0.012)
Constant	0.373*** (0.031)	0.452*** (0.034)
F-test All Topics=0, p-val	0.00	
F-test Clickbait-Incentives X All Topics=0, p-val	0.14	
F-test Viral-Incentives X All Topics=0, p-val	0.42	
F-test Articles=0, p-val		0.00
F-test Clickbait-Incentives X All Articles=0, p-val		0.10
F-test Viral-Incentives X All Articles=0, p-val		0.06
Observations	10,347	10,347
Nr. of receivers	1,294	1,294

Notes: This table displays the estimated coefficients from linear regressions on the likelihood that the receiver clicks to read more, in the Click-Knowledge and the Click-Knowledge-Recall Experiment. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

## E.2.2 Receiver Knowledge When Exposed to Full Materials

Figure E.1: Receiver Knowledge When Exposed to Full Materials



*Notes:* This figure shows the average fraction of correct answers submitted by receivers, who were exposed the 2-page materials (full materials that senders had) about the research article. “Full Materials Available” shows the accuracy of receivers in the Click-Knowledge Experiment, who clicked to read more about the article or were randomly assigned to read more about one article and had them available when answering questions. “Full Materials Recall” shows the accuracy of receivers who clicked to read more about the article or were randomly assigned to read more about one article in the Click-Knowledge-Recall Experiment, but did not have them available when answering questions, and had to answer based on recall. The figure shows the average knowledge over all questions under the “All” panel (left-most), the average knowledge for Finding questions in the “Finding” panel, for Sample questions in the “Sample” panel, for Methods questions in the “Methods” panel, and for Conclusion questions in the “Conclusion” panel (right-most). Detailed estimates shown in Online Appendix Tables E.12 and E.13. Error bars correspond to 95% confidence intervals.

Table E.12: Receiver Knowledge in Click-Knowledge Experiment - Materials Available

	(1)	(2)	(3)
	<b>Likelihood of Correct Answer</b>		
Clickbait-Incentives Summary	0.032*	0.029*	0.023
	(0.018)	(0.017)	(0.017)
Viral-Incentives Summary	-0.031	-0.029	-0.031*
	(0.019)	(0.019)	(0.018)
Click Choice Implemented	-0.008	-0.001	0.007
	(0.021)	(0.021)	(0.021)
Female receiver		0.061***	0.055***
		(0.019)	(0.018)
Age of receiver		-0.001	-0.001
		(0.001)	(0.001)
Social media user		-0.060*	-0.057*
		(0.036)	(0.033)
College education		0.005	0.004
		(0.018)	(0.018)
Time spent		0.000***	0.000***
		(0.000)	(0.000)
Constant	0.819***	0.845***	0.792***
	(0.020)	(0.052)	(0.052)
Receiver characteristics	No	Yes	Yes
Research Article FE	No	No	Yes
Observations	3,788	3,788	3,788
Nr. of receivers	610	610	610
Mean Correct with Info-Incentives Summaries	0.82	0.84	0.79
Mean correct with Clickbait-Incentives	0.85	0.87	0.81
Mean Correct with Viral-Incentives Summaries	0.79	0.82	0.76

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Click-Knowledge Experiment for articles that the receiver chose to read more about (if *Click Choice Implemented* = 1) and for articles that the receiver was assigned to read more about (if *Click Choice Implemented* = 0). Receivers had 2-page materials available when answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table E.13: Receiver Knowledge in Click-Knowledge-Recall Experiment - Materials Recalled

	(1)	(2)	(3)
	<b>Likelihood of Correct Answer</b>		
Clickbait-Incentives Summary	-0.037*	-0.040*	-0.036*
	(0.021)	(0.021)	(0.020)
Viral-Incentives Summary	-0.033	-0.028	-0.036*
	(0.022)	(0.021)	(0.020)
Click Choice Implemented	0.019	0.029	0.041
	(0.027)	(0.027)	(0.026)
Female receiver		0.028	0.035
		(0.023)	(0.022)
Age of receiver		0.002**	0.002**
		(0.001)	(0.001)
Social media user		-0.073	-0.068
		(0.044)	(0.043)
College education		0.013	0.019
		(0.021)	(0.021)
Time spent		0.000***	0.000***
		(0.000)	(0.000)
Constant	0.599***	0.525***	0.467***
	(0.026)	(0.061)	(0.060)
Receiver characteristics	No	Yes	Yes
Research Study and Order FE	No	No	Yes
Observations	4,320	4,320	4,320
Nr. of receivers	599	599	599
Mean Correct with Info-Incentives Summaries	0.60	0.53	0.47
Mean correct with Clickbait-Incentives	0.56	0.48	0.43
Mean Correct with Viral-Incentives Summaries	0.57	0.50	0.43

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Click-Knowledge-Recall Experiment for articles that the receiver chose to read more about (if *Click Choice Implemented* = 1) and for articles that the receiver was assigned to read more about (if *Click Choice Implemented* = 0). Receivers did not have the 2-page materials available, but had to recall them, when answering the questions. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

### E.3 Receiver Beliefs & Intentions

This section reports additional results of the Beliefs & Intentions experiment. Figure 8 in the main text focuses on the behavioral beliefs and intentions of participants. The regressions underlying those coefficients are shown in Table E.14.

Table E.14: Receiver Beliefs and Intentions

	(1) Encourage Others	(2) Believed Dr. Recommendation	(3) Own behavior	(4) Intentions Index
Clickbait-Incentives Summ.	0.153 (0.126) [0.082]	0.259** (0.122) [0.071]	0.253** (0.125) [0.071]	0.333*** (0.128) [0.010]
Viral-Incentives Summ.	0.148 (0.121) [0.500]	0.165 (0.123) [0.500]	0.071 (0.123) [0.500]	0.181 (0.121) [0.135]
Constant	-0.147 (0.096)	-0.248*** (0.094)	-0.040 (0.090)	-0.076 (0.091)
Observations	501	501	498	498

*Notes:* This table displays the estimated coefficients from linear regressions on the fraction of behaviors that the receiver would recommend a behavior to family and friends (column (1)), that the receivers believes are an official doctor recommendation (column(2)), their self-reported intention to change behavior (column(3)), and the intentions index (column (4)). All variables are standardized. The experimental design is described in detail in Section 2.2. Robust standard errors are shown in parentheses (HC3). \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$ . Sharpened FDR  $q$ -values computed using the Anderson (2008) two-stage BKY procedure are shown in square brackets, adjusting across the three individual outcomes per treatment. The Intentions index was not preregistered and is reported separately and, by construction, the  $q$ -value is its  $p$ -value.

#### E.3.1 Pre-registered Analyses

The pre-registration (#165440) stated: “The key dependent variables are the accuracy of beliefs of participants when asked about whether five treatments are recommended by doctors for US adults and children; their recommended treatments to friends and family, their own explanations of behavior change, and their trust in media and science.”

The pre-registration stated “We will test whether messages that attract high attention and low knowledge lead to more mistakes about doctor recommendations, more self and other reported/recommended behavior changes, more trust in media and science, than messages that yield high knowledge and low/high attention; and whether messages that attract high attention and high knowledge lead to more mistakes about doctor recommendations, more self and other reported/recommended behavior changes, more trust in media and science, than messages that attract low attention and high knowledge.” The analyses in Table E.14 deviate from this statement, by pooling together summaries that generated low knowledge among receivers and summaries that generated high knowledge. The deviation, as explained in the main text, was due to the fact that there were no significant differences between them ( $p\text{-val} > 0.05$ ) and the specification of Table E.14 aligns with the rest of the results in the main text.

Table E.15 below separates summaries by whether they yield high or low knowledge. The omitted category are summaries written with Info-Incentives, which yielded low attention,

but high knowledge. The results are broadly consistent with the findings in the main text and Table E.14.

Table E.15: Intentions and Beliefs

	(1) Encourage	(2) Believed Dr. Rec	(3) Own-behavior	(4) Trust scientists	(5) Trust media
Attention Incentives (Clickb./Viral) & High Knowledge	0.035 (0.028)	0.071** (0.033)	0.118** (0.058)	0.105 (0.069)	0.128* (0.076)
Attention Incentives (Clickb./Viral) & Low Knowledge	0.019 (0.027)	0.055* (0.033)	0.061 (0.057)	0.106 (0.069)	0.127* (0.074)
Viral-Incentives Summaries	-0.001 (0.024)	-0.026 (0.029)	-0.085 (0.052)	-0.001 (0.062)	-0.021 (0.067)
Constant	0.651*** (0.028)	0.449*** (0.031)	0.294*** (0.042)	3.140*** (0.061)	2.690*** (0.068)
Observations	2,505	2,505	498	501	501
Nr. of Receivers	501	501			

*Notes:* This table displays the estimated coefficients from linear regressions on: an indicator variable taking value 1 if the receiver recommends the behavior to others (column (1)), believes it is an official doctor recommendation column (2), intended own behavior change (column (3)). The table also displays average trust on scientists (column (4)), and on the media (column (5)), where trust ranges from 1 'Do not trust at all' to 4 'Trust completely'. The regressions include controls for the order of the questions (recomendations or beliefs about doctor recommendations) and whether the attention treatment was Viral-Incentives or not. Robust standard errors are shown in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

### E.3.2 Additional Results

We explore changes in beliefs about doctor recommendations for each behavior in Table E.16. We also explore whether there are features of summaries that explain beliefs about doctor recommendations or encouragement of others in Table E.17. As mentioned in the main text, in Table E.17, we show that summaries that contain incorrect implications are more likely to lead receivers to state the intention to encourage others to take on the corresponding behavior. Table E.18 tests whether trust of scientists and the media increases when receivers are exposed to summaries written with Clickbait- and Viral-Incentives.

Table E.16: Receiver Believed Recommendations by Behavior

	(1) Rocking to Sleep	(2) Diet & Insomnia	(3) Vegetables & Cancer	(4) Vit. A & Cancer	(5) Vaccines
Clickbait-Incentives	0.119** (0.060)	0.048 (0.059)	0.150*** (0.053)	0.032 (0.052)	0.004 (0.025)
Viral-Incentives	0.024 (0.061)	0.004 (0.060)	0.180*** (0.057)	0.021 (0.055)	-0.003 (0.024)
Constant	0.413*** (0.044)	0.599*** (0.044)	0.581*** (0.043)	0.698*** (0.040)	0.947*** (0.019)
Observations	501	501	501	501	501
Belief with Info-Incentives Summ.	0.50	0.61	0.62	0.72	0.96

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver believes each behavior is an official doctor recommendation, for each behavior/topic (columns (1)-(5)). Info-Incentives refers to summaries written with Info-Incentives, and is the constant. Robust standard errors (HC3) shown in parentheses. The regressions include a fixed effect for the order of the questions about doctor recommendations (before or after the questions about encouraging others) and a fixed effect for summaries that yielded low knowledge among receivers. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table E.17: Receiver Encouragement to Others and Believed Recommendations

	(1)	(2)	(3)	(4)
	Encourage	Others	Believed Dr.	Recommendation
Clickbait-Incentives Summ.	0.080		0.159**	
	(0.073)		(0.076)	
Viral-Incentives Summ.	0.087		0.107	
	(0.070)		(0.078)	
Low Knowledge Summ.	-0.042		-0.036	
	(0.061)		(0.068)	
Incorrect implication in summary		0.124**		0.027
		(0.054)		(0.054)
Style Index of summary		-0.021		0.016
		(0.032)		(0.031)
Accuracy Index of summary		0.052*		-0.006
		(0.030)		(0.029)
Focus Index of summary		-0.031		0.008
		(0.026)		(0.025)
Female receiver	0.009	0.003	-0.086	-0.091
	(0.052)	(0.052)	(0.057)	(0.056)
Age of receiver	-0.000	-0.001	-0.003	-0.004*
	(0.002)	(0.002)	(0.002)	(0.002)
Social media user	0.176	0.176	0.192	0.209
	(0.141)	(0.141)	(0.138)	(0.142)
College education	-0.004	0.004	-0.015	-0.005
	(0.053)	(0.052)	(0.056)	(0.056)
Constant	-0.514***	-0.524***	-0.631***	-0.662***
	(0.181)	(0.181)	(0.182)	(0.185)
Observations	2,505	2,505	2,505	2,505
Nr. of Receivers	501	501	501	501

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver would recommend a behavior to their family and friends for 5 different behaviors (columns (1)-(2)), and they would believe it is an official doctor recommendation for five different behaviors (columns (3)-(4)). The following features of the summaries they are presented are included: Incorrect implication, and Accuracy, Style and Focus indices of each summary they read (since they were asked beliefs about vaccines after seeing two summaries about vaccine research, the average values for the two summaries are used in that case). Fixed effects for each behavior are included. Standard errors are clustered at the individual level in columns (1) and (2), shown in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table E.18: Receiver Trust in Science and Media

	(1)	(2)
	Trust scientists	Trust the media
Clickbait-Incentives Summ.	0.187 (0.121)	0.207* (0.124)
Viral-Incentives Summ.	0.184 (0.124)	0.173 (0.125)
Low Knowledge Summ.	0.001 (0.109)	-0.001 (0.109)
Exposure to materials first	0.064 (0.090)	-0.071 (0.091)
Constant	-0.159* (0.095)	-0.088 (0.097)
Observations	501	501
Fraction who trust completely	0.28	0.06

*Notes:* This table displays the estimated coefficients from linear regressions on the trust receivers place on scientists and on the media, standardized. Receivers were also asked about their trust in media and scientists ('How much do you trust scientists?' and 'How much do you trust science that you read about in news articles and on social media?'), on a scale 1 to 4 (from 'Do not trust at all' to 'Trust completely'). Receiver trust was measured before or after they were exposed to 2-page materials about the research, captured in the indicator variable 'Exposure to materials first.' Robust (HC3) standard errors are shown in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

## E.4 Heterogeneity in Click Rates and Knowledge

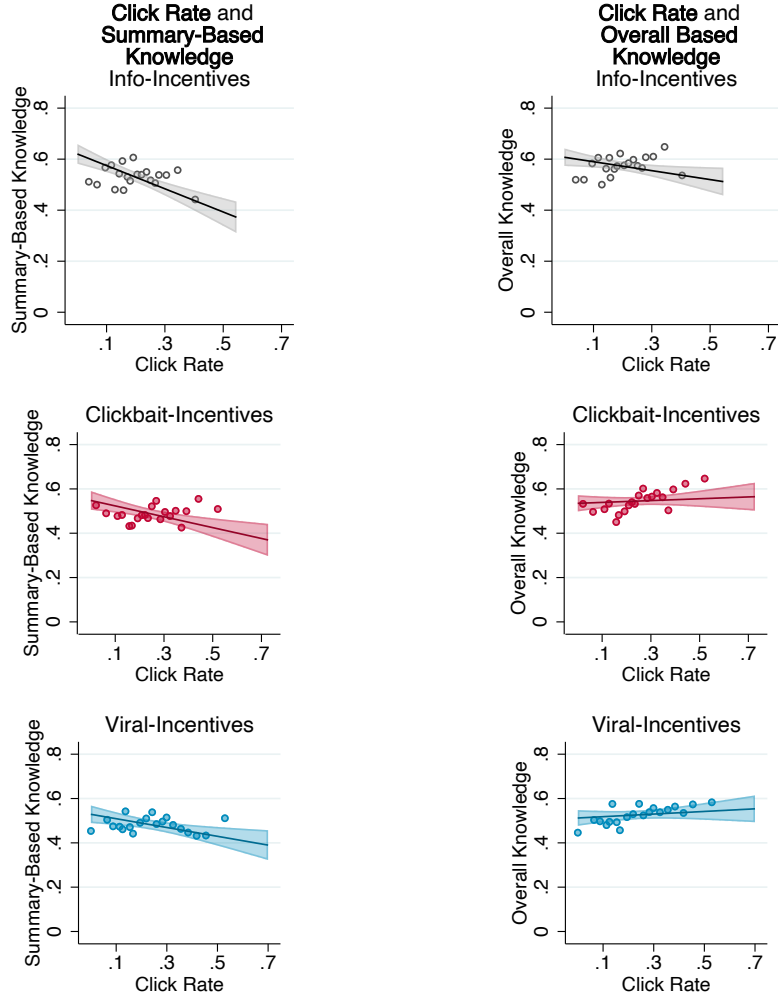
Table E.19 shows the regression analyses on the relationship between click rates and knowledge, shown in Figure 9 in the main text. Figure E.2 shows these figures separately by sender incentives.

Table E.19: Relationship between Clicks and Knowledge

	(1)	(2)	(3)	(4)
	<b>Likelihood of Correct Answer</b>			
	Summary-Based		Overall	
Click Rate	-0.178*** (0.030)	-0.359*** (0.059)	0.056** (0.024)	-0.095* (0.051)
Information Recalled	-0.046*** (0.007)	-0.045*** (0.007)	-0.078*** (0.006)	-0.077*** (0.006)
Clickbait-Incentives Summary	-0.036** (0.016)	-0.075*** (0.023)	-0.031** (0.014)	-0.075*** (0.021)
Viral-Incentives Summary	-0.041*** (0.016)	-0.093*** (0.022)	-0.049*** (0.014)	-0.083*** (0.022)
Clickbait-Inc Summary X Click Rate		0.196** (0.078)		0.211*** (0.063)
Viral-Inc Summary X Click Rate		0.249*** (0.074)		0.165*** (0.063)
Constant	0.589*** (0.013)	0.624*** (0.017)	0.601*** (0.011)	0.630*** (0.016)
Observations	1,184	1,184	1,190	1,190
Coefficients:				
<i>Click Rate+Clickbait-Inc Summary X Click Rate</i> ( <i>p-value</i> )		-0.162 0.001		0.115 0.002
<i>Click Rate+Viral-Inc Summary X Click Rate</i> ( <i>p-value</i> )		-0.109 0.015		0.070 0.056

*Notes:* This table displays the estimated coefficients from linear regressions on receiver knowledge based on summaries (columns (1)-(2)) and overall (columns (3)-(4)). Click rate is the frequency with which receivers clicked on the summaries in the Click-Knowledge and Click-Knowledge-Recall experiments. Information recalled is an indicator variable for whether receivers had to recall the summary or 2-page materials (*Information Recalled* = 1) or had them available when answering the knowledge questions (*Information Recalled* = 0). Robust standard errors in parentheses, clustered at the message level. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Figure E.2: Receiver Knowledge and Click Rate, by Sender Incentives



*Notes:* The left column of plots in this figure shows the average click rate on each message (x-axis) and receiver knowledge when receivers are exposed to the summary (y-axis) pooling all Sender Incentive treatments. Receiver knowledge is an average of the fraction of correct answers when receivers have the summary available to answer the questions and when they must recall it. Each dot represents a demi-decile of the distribution. The right column of this figure shows the average click rate (x-axis) and the overall receiver knowledge, accounting for the knowledge gained by those who click and access 2-page summary materials about the research. Receiver knowledge is an average of the fraction of correct answers when receivers have the information (summary or 2-page materials) available and when they must recall it. The two top panels show results for summaries written with Info-Incentives, the two middle panels show results for Clickbait-Incentives and the two bottom panels show results for Viral-Incentives.

Table E.20 shows the estimated relationships between summary features in terms of accuracy, focus, and style, and the resulting knowledge of receivers (fraction of correct answers in column (1) and above-median performance in knowledge in column (2)) clicks, (click rate in column (3) and above-median click rate in column (4)), and above-median knowledge and click rate simultaneously (column (5)). Summaries that include Accurate-In text information (higher accuracy index) are associated with more knowledge among receivers, but attract fewer clicks. By contrast, summaries with an attractive writing style (higher style index) are associated with less knowledge. Above-median knowledge and clicks is difficult to predict (with an  $R^2$  of 0.09). The indices for accuracy, focus and style do not show a clear linear relationship with above-median knowledge and clicks.

Table E.20: Predictors of Knowledge and Attention

	(1)	(2)	(3)	(4)	(5)
	Knowledge	Above Median Knowledge	Information & Attention Clicks	Above Median Clicks	Above Median Knowledge & Clicks
Accuracy Index	0.006 (0.005)	0.026 (0.016)	-0.013** (0.006)	-0.017 (0.017)	0.007 (0.015)
Focus Index	0.015*** (0.005)	0.035** (0.014)	-0.002 (0.006)	0.002 (0.016)	0.023 (0.014)
Style Index	-0.031*** (0.006)	-0.053*** (0.016)	0.022*** (0.007)	0.045** (0.020)	-0.006 (0.015)
Click incentives	-0.019 (0.013)	0.004 (0.035)	0.037*** (0.012)	0.098** (0.040)	0.065** (0.032)
Viral incentives	-0.012 (0.014)	0.004 (0.037)	0.026* (0.014)	0.050 (0.041)	0.090*** (0.032)
Information Recalled	-0.053*** (0.007)	-0.002 (0.026)	0.041*** (0.010)	0.013 (0.026)	0.004 (0.021)
Constant	0.364*** (0.013)	0.128*** (0.039)	0.346*** (0.018)	0.797*** (0.043)	0.053 (0.034)
Observations	1,184	1,184	1,190	1,190	1,184
R-Squared	0.45	0.29	0.21	0.15	0.09
Article FE	Yes	Yes	Yes	Yes	Yes

*Notes:* This table displays coefficients from linear regressions. The variable Knowledge is the average frequency of correct responses to knowledge questions for each summary, both for summaries available and recalled, and the variable Clicks is the click rate. The variables Above Median Knowledge and Clicks are indicator variables that take value 1 if Knowledge and Clicks are above median, respectively. Each indicator is calculated within the same condition (for summaries available and recalled separately). The variable High Knowledge & High Clicks is an indicator that takes value 1 if the message has an above median Knowledge value and an above median click rate. There are 1,190 (= 595 × 2) observations for clicks. Due to random implementation, not all summaries were observed by receivers in the Click-Knowledge-Recall experiment, resulting in 1,184 (= 595 + 589) being observed. All regressions include an control indicator variable for whether summaries were available or recalled. Robust standard errors at the sender level shown in parentheses.

## E.5 Sharing Beliefs: Experimental Evidence

### E.5.1 Experimental Design

As mentioned in the main text, we also conducted a Sharing experiment. The Sharing experiment measures receivers’ beliefs about which summaries will be shared most frequently on social media. After reading eight summaries, their task was to select which one would be shared most often if posted on social media. They received a bonus of \$1 if they selected the summary that was believed by most other participants to be shared on social media. The incentive acts as a coordination game, and a concern may be that receivers’ beliefs do not reflect their own beliefs. In a robustness experiment, we removed the incentives and the results remain qualitatively similar, as reported in Online Appendix Section E.5.5. As in the Click-Knowledge experiment, receivers were exposed to one of two conditions, which combined summaries from the Information and Clickbait-Incentives treatment or the Information and Viral-Incentives treatment.

A disadvantage of this design is that it does not measure actual sharing behavior, but beliefs about sharing. Cleanly measuring the sharing of summaries created by senders on a social media platform is challenging because actual sharing decisions on these platforms are a mixture of exposure, which is controlled by the platform, and user decisions. Additionally, since some summaries contained incomplete information that could be misleading, only a subset of summaries could ethically be posted, potentially biasing the resulting sharing.

The Sharing experiment was conducted in two waves. The first wave included 262 participants to be exposed to summaries written by professionals (by human error this number was smaller than the 300 pre-registered, # 134042) and the second wave included 349 participants (as part of pre-registration #170901). The effect of sender’s incentives on sharing choices do not vary by wave ( $p$ -value= 0.802 and  $p$ -value= 0.241 for Viral- and Clickbait-Incentives respectively) and hence we report results for pooled sharing choices in what follows. An additional 267 participants completed this experiment and were exposed to summaries written by an LLM.

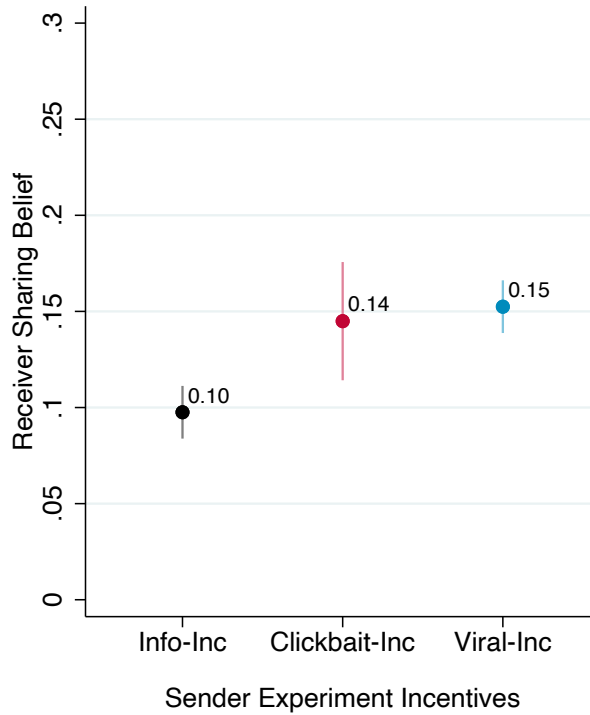
### E.5.2 Main Results

Summaries written by professionals under Viral incentives are the most likely to be selected as those that would be broadly shared as shown in Figure E.3. Compared to summaries written with Info-incentive, which are selected 10% of the time, summaries written with Viral-Incentives are selected 15% of the time, significantly more often ( $p$ -value < 0.01). Summaries written with Clickbait-Incentives are also more likely to be selected ( $p$ -value= 0.001).

### E.5.3 Sharing and Knowledge

Estimating sharing rates (virality) online is difficult for most people. For that reason, in the Sharing experiment we elicit receivers’ beliefs about which summary among a set of 8 summaries would most likely be shared online. Here we discuss how we can use the elicited beliefs to provide an estimate of how much knowledge would spread through sharing. While with click rates we estimate overall knowledge as a weighted average of the knowledge of those who click and learn more about the research and those who do not, for sharing we

Figure E.3: Receiver Beliefs About Sharing



*Notes:* This figure shows the fraction of summaries, by sender incentives, selected as the most shared. The average is calculated using a regression that controls for the summary group seen by the receiver (either Information-Click, or Information-Viral). 95% confidence intervals are calculated using standard errors clustered at the receiver level. Hence, if their beliefs were independent of incentives, the belief about the most shared summary would be 12.5% ( $N = 611$ ).





estimate what rate of sharing would be needed to overcome the losses in knowledge due to the less informative summaries created with Viral incentives.

We provide an estimate that is only valid when comparing across treatments, and not in its levels. We approximate the overall knowledge after sharing ( $K_s$ ) as follows. For each summary, we use the frequency with which the summary was selected as most likely to be shared as the “sharing rate”  $r_s$ . An individual is able to share a summary with a group of  $N$  individuals, at the sharing rate. Then, these new receivers can choose to click on it. This means that  $K_s$  is the result of the knowledge after clicking both for the individual exposed to it and for those with whom they share the summary. We thus define  $K_s = K_c + Nr_s K_c$ . With Viral-Incentives, we ask what  $N$  makes the overall information between senders with Info-Incentives and senders with Viral-Incentives the same (to compensate for the lower information in the summary itself with Viral-Incentives), without an explicit hypothesis.

Using the behavior in the Sharing and in the Knowledge experiments, we compare the overall knowledge of receivers in two scenarios. A first, baseline scenario does not have sharing with others. This scenario yields the same overall knowledge as that based on clicks only. As the first row of Table E.21 shows, overall knowledge is highest under Info-Incentives. In the second scenario, we allow sharing. If the sender shares, other individuals are exposed

to the shared summary and may click on it. To calculate the knowledge combined with sharing, we use  $K_s$ , as defined above. For example, if a message leads to an  $K_c$  of 60%, and the sharing rate is 15% with a group of 2 individuals, who then may click on the summary themselves:  $K_s = 0.6 + 2 \cdot 0.15 \cdot 0.60 = 0.78$ . The second row in Table E.21 assumes the group size is 2. It shows the average overall knowledge with sharing, calculated at the message level, when the group is of size 2. Viral-Incentives lead to the same  $K_s$  as Information incentives. Hence, if the group of individuals with whom sharing occurs is 2 or larger, and the sharing rate is 15% with Viral-Incentives, messages written with Viral-Incentives would lead to the same knowledge ( $K_s = 0.78$ ) as messages written with Information incentives, which have lower sharing rates (10%).

Table E.21: Receiver Knowledge with Sharing

	(1)	(2)	(3)
	Info-Inc.	Clickbait-Inc.	Viral-Inc.
 - no sharing- 	0.63	0.61	0.58
 - sharing- 	0.78	0.79	0.78

This table shows the average fraction of correct responses in two cases. The first scenario, no sharing, assumes only one individual is exposed to the message, and others have no knowledge about the research. The second scenario, sharing, assumes the individual shares each message with the sharing frequency of the sharing treatment.  $K_s = K_c + Nr_s K_c$ . Individuals receiving the message via sharing click on the message with the same rate as the first individual exposed to the message. The averages are calculated at the message level.

#### E.5.4 Sharing Experiment Instructions

*The experiment was conducted on Qualtrics. After participants consented to participate in the study, they saw the following screens. Across participants, the summaries they were exposed to were either from the Information and Clickbait-Incentives treatments or the Information and Viral-Incentives treatments. The summaries were shown in random order.*

#### This Study

In the following you will be shown 8 summaries about different research studies.

Each summary is based on a detailed 2-page summary of the study.

#### Your Task

In the following screen, you will be asked to complete the following steps:

- **Read 8 summaries** about different research studies.
- Choose the summary that you **believe would be shared most often if posted on social media**. By “shared” we mean receive likes or shares, on a social media platform, such as Twitter.

**If the summary you choose is the one chosen most often by other participants in your role, you will earn a bonus of \$1.**

**Comprehension Question: Which of the following is correct?**

Please re-read the instructions above. You will have 2 opportunities to answer this question correctly.

**My task is...**

- ...to choose the summary about a research study that would be shared the most if posted on social media.
- ...to choose the summary about a research study that I would like to correct and edit.
- ...to choose the summary about a research study that will be rated highest by another participant.

**Comprehension Question: Which of the following is correct?**

Please re-read the instructions above. You will have 2 opportunities to answer this question correctly.

- I earn a bonus of \$1 if my rating is the same as that of another participant.
- I earn a bonus of \$1 if I choose the summary that is chosen most often by other participants in my role.
- I earn a bonus of \$1 if I correctly edit the summary that I choose.

### **E.5.5 Sharing Beliefs: Robustness Experiment**

We conducted an additional experiment in which beliefs about sharing were elicited using a different experimental design. The results are qualitatively similar to those in the main Sharing experiment, as detailed below.

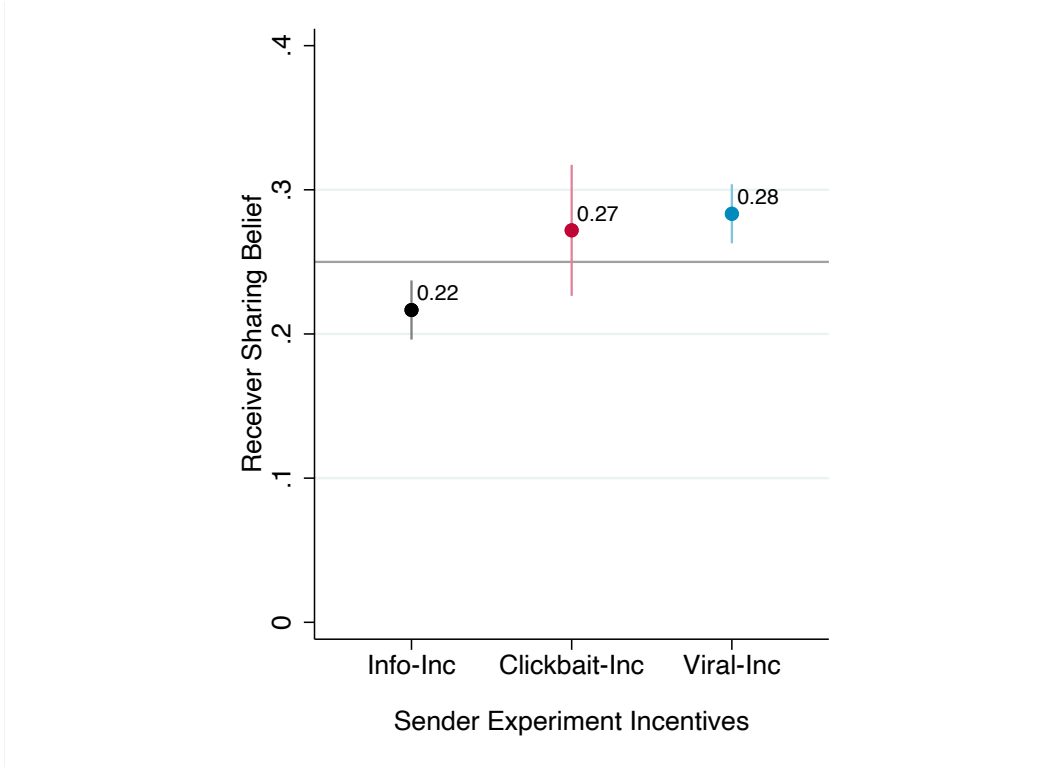
**Design:** In this experiment, receivers were shown 4 summaries about the same research article. They were asked to select one summary as the one that they believed would be shared most frequently on social media. This question was unincentivized. As in the Sharing experiment, the receiver was assigned to one of two conditions. In one condition, they saw two summaries written under Information incentives and two summaries written under Clickbait-Incentives. In the other condition, they saw two summaries written under Information incentives and two summaries written under Viral-Incentives. The main differences from the Sharing experiment, in addition to the incentives, are that in this experiment receivers reported their belief about sharing eight times, once for each research article. By contrast, in the Sharing experiment the receiver chose one summary about one research article, out of 8 summaries about 8 different research articles. Hence, when the receiver chooses which

article would be most shared, in this robustness experiment the research article is held fix, and how it is described varies.

The experiment was pre-registered on Aspredicted (#130993). There were 198 subjects who completed the study and were exposed to summaries written by professionals. An additional 206 completed the study and were exposed to summaries written an LLM.

**Results:** Figure E.4 shows that receivers selected summaries as most shared 21% of the time if the summary was written by professionals under Info-Incentives, 28% of the time if the summary was written under Clickbait-Incentives, and 27% of the time if the summary was written under Viral-Incentives. Both Clickbait- and Viral-Incentives significantly increased the likelihood of sharing, according to receivers ( $t$ -test,  $p < 0.01$  in both cases). These results are in line with the increased sharing beliefs in the Sharing experiment.

Figure E.4: Beliefs About Sharing



*Notes:* This figure shows the fraction of summaries, by sender incentives, selected as the most shared. The average is calculated using a regression that controls for the summary group seen by the receiver (either Information-Clickbait or Information-Viral). 95% confidence intervals are calculated using standard errors clustered at the receiver level. For each research article, receivers saw 4 summaries and they could choose 1 out of 4 as the one that would be most broadly shared on social media. Hence, if their beliefs were independent of incentives, the belief about the most shared summary would be 25% for each summary, indicated by the gray line ( $N = 198$ ).

Focusing on messages written by the LLM, we obtain similar results. Receivers selected summaries as most shared 18% of the time if the summary was written by an LLM with Information incentives. By contrast, summaries written with Click and Viral-Incentives were selected 31% and 32% of the time ( $t$ -test,  $p < 0.01$  in both cases).

## E.6 Donation Decisions: Experimental Evidence

### E.6.1 Experimental Design

This experiment measures how incentives to grab online attention may affect receivers’ support for policy causes, measured through their willingness to donate to causes related to vaccination and climate. Exposing participants to a summary and asking them to donate to the cause right away could raise concerns about experimenter demand effects. To reduce these concerns, the experiment consisted of two parts. First, participants were exposed to 8 summaries, one about each research article. To ensure they read the summaries and engaged with them, they were asked to read each summary and write one sentence summarizing what they read.

After the first part was completed, participants made two donation decisions. In each decision, the participant chose between receiving \$0.25 or donating \$1, to the Wildlife Conservation Society in one decision and the Measles & Rubella Partnership in the other. One decision was randomly selected and implemented.

We pre-registered the experiment (Aspredicted.org #132998). In total, there were 303 participants exposed to summaries written by freelancers, of whom 299 provided complete responses (4 participants did not answer both donation questions). Additionally, 202 participants were exposed to summaries written by the LLM. We first present results for summaries written by freelancers, and then describe those in response to summaries written by the LLM.

### E.6.2 Results

On average, 33% of receivers donate to a climate cause after they are exposed to summaries written under Information incentives, 38% of receivers under Clickbait-Incentives, and 42% under Viral-Incentives. Similarly, 25% of receivers donate to support vaccines after they are exposed to summaries written under Information incentives, 33% under Clickbait-Incentives, and 29% under Viral-Incentives. Table E.22 shows regression results for the donation decisions of receivers. Columns (2) and (4) add receiver characteristics (age, gender, and social media use). Although the coefficients are positive, we do not detect statistically significant effects of Clickbait- and Viral-Incentives, potentially due to the limited sample size and the moderate effects, of 4-7pp.

When receivers are exposed to summaries written by a LLM ( $N = 202$ ), 38% of receivers donate to a climate cause after they are exposed to summaries written under Info-Incentives, 41% of receivers under Clickbait-Incentives, and 37% under Viral-Incentives. Similarly, 27% of receivers donate to support vaccines after they are exposed to summaries written under Information incentives, 36% under Clickbait-Incentives, and 27% under Viral-Incentives.

Table E.22: Support of Vaccines and Climate Protection: Donations

	(1)	(2)	(3)	(4)
	Climate Donation		Vaccine Donation	
Clickbait-Incentives Summary	0.044 (0.068)	0.016 (0.068)	0.072 (0.065)	0.045 (0.065)
Viral-Incentives Summary	0.091 (0.069)	0.086 (0.069)	0.038 (0.064)	0.034 (0.064)
Female receiver		0.085 (0.058)		0.057 (0.055)
Age of receiver		0.005** (0.002)		0.006*** (0.002)
Social media user		-0.193 (0.118)		-0.146 (0.121)
College education		-0.063 (0.057)		0.005 (0.053)
Constant	0.333*** (0.047)	0.310* (0.166)	0.255*** (0.044)	0.121 (0.159)
Observations	299	299	299	299
Info-Inc.: Predicted Donation Prob.	0.33	0.31	0.25	0.12
Clickbait-Inc.: Predicted Donation Prob.	0.38	0.33	0.33	0.17
Viral-Inc.: Predicted Donation Prob.	0.42	0.40	0.29	0.15

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver makes a donation. The two nonprofit organizations were the Wildlife Conservation Society (Climate Donation), and the Measles&Rubella Project (Vaccine Donation). Columns (2)-(4) include receiver age and an indicator for those identifying as female, and as social media users. Each receiver made two donation decisions. Robust (HC3) standard errors are shown in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

## F LLM: Details and Additional Results

### F.1 LLM as Sender

LLMs can be used to summarize information like professionals. We generated summaries of the research articles. We prompted GPT about its understanding of the instructions by treatment, and its responses demonstrate it correctly interpreted the task (as we show in the instructions and its understanding responses below). The LLM supplied 360 summaries (15 for each article in each treatment, without providing it feedback or training) that serve two purposes. First, to examine how an LLM responds to the goal of grabbing attention. Second, to compare its summaries to those sent by professionals. Professionals could have used GPT, which would also be informative as to how they generate summaries about research findings. The findings in Section 3.3 suggest that this behavior was unlikely.

While GPT reduces the costs of producing content, it can also be used maliciously (e.g., Goldstein et al., 2023, Kapoor and Narayanan, 2023). Given that the LLM was asked to create content summarizing the materials it was provided about the research articles, it is unlikely that it would misrepresent the research. But the LLM could select any part of the materials to report about and provide different information depending on its objective.

#### F.1.1 GPT: Implementation and Instructions

Summaries were elicited from GPT between February and early March of 2023, based on the GPT-3.5 generation of this LLM. For each article and each treatment in the Sender Experiment, the same request was made to the model, without corrections or feedback. The aim was to explore what kinds of summaries the model generates without training or corrections, which would have been different between treatments and would have generated additional differences between treatments that are not present within the Fiverr setting with professional (human) senders.

The request to GPT was worded as follows:

- In the Information treatment: “Write 1 headline and 3 sentences that are informative about the following text:”
- In the Viral treatment: “Write 1 headline and 3 sentences that will be shared on social media about the following text:”
- In the Click treatment: “Write 1 headline and 3 sentences that will interest readers in reading more about the following text:”

After the colons, the request included the same materials provided to professionals on Fiverr, a 1-2 page summary of the research article, including its abstract and press release.

Prior to eliciting all the summaries, to ensure that the instructions were understood by GPT as intended through the treatment variation, we asked the LLM the following questions, and obtained the answers shown below.

Question Asked to GPT: When you write text that is informative, what features does it have?

Answer: *When writing informative text, there are several features that are important to include in order to effectively convey information to the reader:*

1. *Clarity: The text should be clear and concise, using language and terms that are easily understood by the intended audience.*
2. *Objectivity: The text should present information in a factual and objective manner, without personal bias or opinions.*
3. *Organization: The text should be well-organized and structured, with clear headings and subheadings to help readers navigate the information.*
4. *Evidence: The text should be supported by evidence, such as research, data, or examples, to back up the information presented.*
5. *Citations: Any sources used should be properly cited to give credit to the original authors and to allow readers to further explore the information presented.*
6. *Tone: The tone should be appropriate to the subject matter, balancing seriousness with accessibility to keep readers engaged.*
7. *Conclusion: The text should have a clear and concise conclusion that summarizes the key points and provides a final takeaway for the reader.*

Question Asked to GPT: When you write text that will be shared on social media, what features does it have?

Answer: *When writing text that will be shared on social media, there are a few key features to consider:*

1. *Attention-grabbing headline: The headline should be short, catchy, and attention-grabbing to make people want to click and read more.*
2. *Brief and concise: The text should be short, sweet, and to the point, as social media users tend to scroll through their feeds quickly.*
3. *Engaging and shareable: The content should be relatable, informative, and/or entertaining, so that users are more likely to engage with it and share it with their followers.*
4. *Visual content: Visual content such as images, videos, or infographics can help to make your post more engaging and shareable.*
5. *Relevant hashtags: Including relevant hashtags can help your post to reach a wider audience and increase engagement.*
6. *Call to action: A clear call to action, such as "Learn more," "Shop now," or "Share with your friends," can encourage users to take action and engage with your content.*

Question Asked to GPT: When you write text that will interest readers in reading more, what features does it have?

Answer: *When writing text that aims to interest readers in reading more, it should have the following features:*

1. *Attention-grabbing headline: The headline should be interesting and attention-grabbing, so that the reader is immediately drawn to the article or piece of content.*
2. *Clear and concise introduction: The introduction should be concise and to the point, clearly summarizing what the article is about and why the reader should care.*
3. *Relevant and engaging content: The content should be relevant to the headline and introduction, and should be written in an engaging and easy-to-read style that keeps the reader interested.*
4. *Use of visuals: The use of visuals, such as images, videos, or infographics, can help to make the content more engaging and interesting to readers.*
5. *Strong conclusion: The conclusion should provide a clear takeaway message for the reader, summarizing the main points of the article and leaving the reader with something to think about or act upon.*
6. *Call-to-action: A call-to-action can be included to encourage the reader to take action, whether that's reading more content, subscribing to a newsletter, or making a purchase.*

This section reports the results of the Sender experiment, when the sender was an LLM (GPT) instead of professionals. Tables F.1, F.2, F.3 show the impact on accuracy, focus, and writing style depending on the treatment that GPT was instructed to follow (Clickbait-Incentives or Viral-Incentives, compared to Info-Incentives).

Table F.1: Incentive Effects on Accuracy

	(1)	(2)	(3)
	Accuracy of Units:		
	Accurate-In text	Inaccurate-In text	Not in text
Clickbait-Incentives	-0.333** (0.165) [0.155]	0.058 (0.053) [0.218]	0.075 (0.049) [0.155]
Viral-Incentives	-0.608*** (0.157) [0.001]	0.092* (0.055) [0.104]	0.025 (0.043) [0.231]
Constant	5.781*** (0.262)	0.417*** (0.106)	0.500*** (0.118)
Observations	360	360	360
Info-Incentives: Mean	5.183	0.150	0.083
Info-Incentives: SD	1.539	0.381	0.306

*Notes:* This table presents average marginal effects from linear regression on the accuracy of GPT's summaries. Each unit was classified as Accurate-In text, Inaccurate-In text, or Not in text. The number of units of each type is the dependent variable in each column. Robust standard errors (HC3) are reported in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01.

Table F.2: Incentive Effects on Summary Focus

	(1)	(2)	(3)	(4)
	Introduction	Method	Finding	Conclusion
Clickbait-Incentives	0.308*** (0.087) [0.002]	-0.133** (0.060) [0.020]	-0.292*** (0.104) [0.009]	-0.083 (0.100) [0.113]
Viral-Incentives	0.200*** (0.075) [0.006]	-0.192*** (0.057) [0.002]	-0.467*** (0.097) [0.001]	-0.033 (0.106) [0.232]
Constant	0.608*** (0.132)	0.464*** (0.080)	4.408*** (0.160)	1.217*** (0.141)
Observations	360	360	360	360
Info-Incentives: Mean	0.400	0.642	2.942	1.433
Info-Incentives: SD	0.600	0.547	0.998	0.923

*Notes:* This table presents average marginal effects from linear regression on the focus of the units in GPT’s summaries. Each unit was classified into Introduction, Method, Finding, and Conclusion. No units were classified as Call to Action. For each type, the number of units is the dependent variable in columns (1)-(4). Robust standard errors (HC3) are reported in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01.

Table F.3: Incentive Effects on Sender Style

	(1)	(2)	(3)	(4)	(5)
	Length	Nr. of units	Sentiment	Punctuation	Readability
Clickbait-Incentives	-12.183*** (3.332) [0.002]	-0.200 (0.154) [0.242]	0.059 (0.070) [0.429]	-0.000 (0.013) [0.667]	3.084*** (1.121) [0.013]
Viral-Incentives	-19.458*** (3.337) [0.001]	-0.492*** (0.149) [0.003]	-0.008 (0.053) [0.213]	0.075*** (0.026) [0.005]	2.984*** (1.106) [0.006]
Constant	121.814*** (4.681)	6.697*** (0.261)	1.784*** (0.128)	-0.025** (0.012)	21.613*** (1.311)
Observations	360	360	360	360	360
Info-Incentives: Mean	118.04	5.42	-0.02	0.01	18.99
Info-Incentives: SD	34.22	1.56	0.92	0.09	11.28

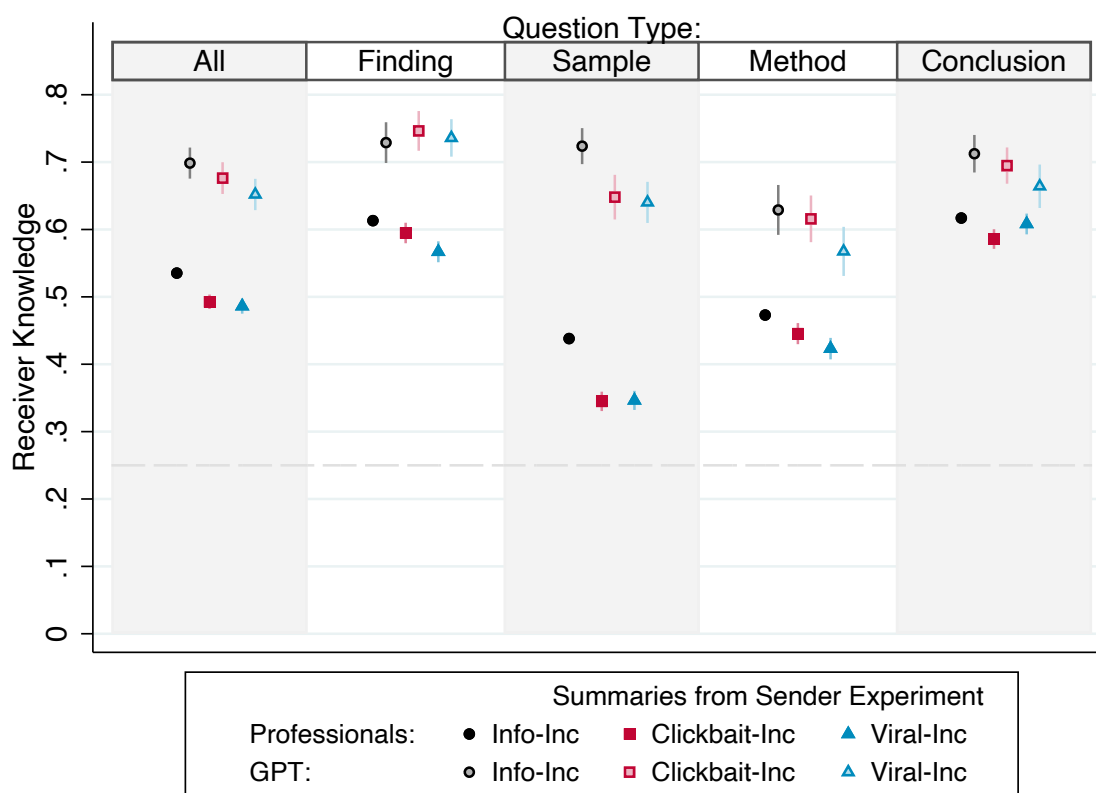
*Notes:* This table displays the estimated average marginal effects from linear regressions on length, unit count, readability, sentiment and punctuation. We show the estimated average marginal effects for length (measured as the number of words, column (1)), number of units (column (2)) sentiment (measured as the standardized sentiment score, column (3)), punctuation (an indicator if the summary uses question marks, exclamation marks, ellipsis, hashtags or icons, column (4)) and readability (measured as the Flesch reading ease score, column (5)). Robust standard errors (HC3) are reported in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01.

### F.1.2 Impact of LLM-sourced Summaries on Receivers

This section reports the results of the Knowledge experiment, when the summaries were written by an LLM (GPT) instead of professionals (pre-registrations #126898 and #129097).

Figure F.1 shows the differences in knowledge by treatment, depending on whether senders were professionals or GPT. The losses in knowledge are in the same dimensions with an LLM as sender as with professionals. In the Clickbait-Incentives treatment, receivers are significantly (10pp) less likely to answer questions about the sample correctly. In the Viral-Incentives treatment, receivers are also 10pp less likely to answer questions about the sample correctly, 9pp less likely to answer questions about the methods correctly, and 7 pp less likely to answer questions about the conclusion correctly (all  $p$ -value < 0.001).

Figure F.1: Receiver Knowledge After Summaries by Professionals and LLM



*Notes:* This figure shows the average fraction of correct answers submitted by receivers, who were only exposed to summaries about the research article either as submitted by Professionals or by GPT. In all cases receivers had the summaries available while answering the questions. Detailed regression estimates shown in Online Appendix Tables E.5 and F.4. Error bars correspond to 95% confidence intervals.

Tables F.4 and F.5 show the estimated impact of summaries written under different instructions on the knowledge of receivers when answering knowledge questions, with summaries available. The effects by topic and article are shown in Table F.6. Table F.7 shows the difference in click rates for summaries written under different instructions. The effects by topic and article are shown in Table F.8.

Table F.4: LLM Sender - Receiver Knowledge - Summary Available

	(1)	(2)	(3)
	<b>Likelihood of Correct Answer</b>		
Clickbait-Incentives Summary	-0.016 (0.018)	-0.015 (0.018)	-0.016 (0.018)
Viral-Incentives Summary	-0.047** (0.018)	-0.048*** (0.018)	-0.048*** (0.018)
Female receiver		0.054*** (0.015)	0.053*** (0.015)
Age of receiver		-0.001* (0.001)	-0.001* (0.001)
Social media user		0.000 (0.022)	0.000 (0.022)
College education		0.030** (0.014)	0.030** (0.014)
Time spent		-0.000** (0.000)	-0.000 (0.000)
Constant	0.678*** (0.013)	0.683*** (0.032)	0.483*** (0.035)
Receiver characteristics	No	Yes	Yes
Research Article and Order FE	No	No	Yes
Observations	11,520	11,520	11,520
Nr. of receivers	360	360	360
Mean Correct with Info-Incentives Summaries	0.68	0.68	0.48
Mean correct with Clickbait-Incentives	0.66	0.67	0.47
Mean Correct with Viral-Incentives Summaries	0.63	0.63	0.44

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment when exposed to summaries written by GPT. Receivers had the summary available when answering the questions. Each receiver answered 32 questions, 4 for each research study. The regressions pool all questions together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, that they have at least a 4-year college education and time spent answering the question. Robust standard errors, clustered at the receiver level, in parentheses. \*  $p < .10$ ; \*\*  $p < .05$ ; \*\*\*  $p < .01$

Table F.5: LLM Sender - Receiver Knowledge - Summary Available

	(1)	(2)	(3)
	<b>Likelihood of Correct Answer</b>		
Clickbait-Incentives Summary	0.024 (0.024)	0.028 (0.024)	0.027 (0.023)
Viral-Incentives Summary	0.019 (0.023)	0.016 (0.023)	0.016 (0.023)
Sample Question	-0.032* (0.019)	-0.049** (0.019)	-0.044** (0.019)
Method Question	-0.118*** (0.018)	-0.135*** (0.019)	-0.130*** (0.019)
Conclusion Question	-0.030* (0.018)	-0.046** (0.019)	-0.042** (0.019)
Clickbait-Incentives Summary X Sample Question	-0.096*** (0.026)	-0.099*** (0.026)	-0.098*** (0.026)
Clickbait-Incentives Summary X Method Question	-0.033 (0.025)	-0.037 (0.025)	-0.036 (0.025)
Clickbait-Incentives Summary X Conclusion Question	-0.029 (0.023)	-0.033 (0.023)	-0.032 (0.023)
Viral-Incentives Summary X Sample Question	-0.102*** (0.025)	-0.097*** (0.025)	-0.098*** (0.025)
Viral-Incentives Summary X Method Question	-0.092*** (0.027)	-0.092*** (0.027)	-0.092*** (0.027)
Viral-Incentives Summary X Conclusion Question	-0.069*** (0.026)	-0.068*** (0.026)	-0.068*** (0.026)
Constant	0.722*** (0.017)	0.748*** (0.035)	0.550*** (0.038)
Receiver characteristics	No	Yes	Yes
Research Article and Order FE	No	No	Yes
Observations	11,520	11,520	11,520
Nr. of receivers	360	360	360
Finding Question Correct with Info-Incentives	0.72	0.75	0.55
Finding Question Correct with Clickbait-Incentives	0.75	0.78	0.58
Finding Question Correct with Viral-Incentives	0.74	0.76	0.57
Sample Question Correct with Info-Incentives	0.69	0.70	0.51
Sample Question Correct with Clickbait-Incentives	0.62	0.63	0.43
Sample Question Correct with Viral-Incentives	0.61	0.62	0.42
Method Question Correct with Info-Incentives	0.60	0.61	0.42
Method Question Correct with Clickbait-Incentives	0.60	0.60	0.41
Method Question Correct with Viral-Incentives	0.53	0.54	0.34
Conclusion Question Correct with Info-Incentives	0.69	0.70	0.51
Conclusion Question Correct with Clickbait-Incentives	0.69	0.70	0.50
Conclusion Question Correct with Viral-Incentives	0.64	0.65	0.46

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment when exposed to summaries written by GPT. Receivers had the summary available when answering the questions. The regression includes indicator variables for the type of question (Sample, Method, Conclusion, where Finding is the omitted category) and interacts the type of question with the sender's incentive in the Sender Experiment. Each receiver answered 32 questions, 4 for each research study. The regressions pool all questions together. Receiver characteristics include whether the receiver identifies as female, their reported age, whether they indicate they use at least one social media platform, that they have at least a 4-year college education and time spent answering the question. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table F.6: LLM Sender - Receiver Knowledge - By Topic and Article

	(1)	(2)
	Likelihood of Correct Answer	
Clickbait-Incentives	-0.040 (0.026)	-0.104*** (0.033)
Viral-Incentives	-0.054** (0.025)	-0.084*** (0.031)
Cancer	0.046** (0.022)	
Vaccines	0.321*** (0.019)	
Climate	0.178*** (0.021)	
Clickbait-Incentives Summaries=1 × Cancer	0.066** (0.031)	
Clickbait-Incentives Summaries=1 × Vaccines	0.015 (0.026)	
Clickbait-Incentives Summaries=1 × Climate	0.016 (0.029)	
Viral-Incentives Summaries=1 × Cancer	0.022 (0.030)	
Viral-Incentives Summaries=1 × Vaccines	-0.009 (0.028)	
Viral-Incentives Summaries=1 × Climate	0.011 (0.029)	
Gangwisch et al. (2020)		0.033 (0.027)
Lee et al. (2019)		0.070** (0.027)
Kim et al. (2019)		0.056* (0.031)
Mina et al. (2019)		0.289*** (0.027)
Hviid et al. (2019)		0.387*** (0.025)
Maxwell et al. (2019)		0.166*** (0.027)
Berzaghi et al. (2019)		0.223*** (0.031)
Clickbait-Incentives Summaries=1 × Gangwisch et al. (2020)		0.128*** (0.038)
Clickbait-Incentives Summaries=1 × Lee et al. (2019)		0.139*** (0.039)
Clickbait-Incentives Summaries=1 × Kim et al. (2019)		0.121*** (0.045)
Clickbait-Incentives Summaries=1 × Mina et al. (2019)		0.071* (0.039)
Clickbait-Incentives Summaries=1 × Hviid et al. (2019)		0.086** (0.037)
Clickbait-Incentives Summaries=1 × Maxwell et al. (2019)		0.074* (0.038)
Clickbait-Incentives Summaries=1 × Berzaghi et al. (2019)		0.088** (0.043)
Viral-Incentives Summaries=1 × Gangwisch et al. (2020)		0.060 (0.038)
Viral-Incentives Summaries=1 × Lee et al. (2019)		0.054 (0.038)
Viral-Incentives Summaries=1 × Kim et al. (2019)		0.051 (0.043)
Viral-Incentives Summaries=1 × Mina et al. (2019)		-0.002 (0.038)
Viral-Incentives Summaries=1 × Hviid et al. (2019)		0.044 (0.035)
Viral-Incentives Summaries=1 × Maxwell et al. (2019)		-0.002 (0.039)
Viral-Incentives Summaries=1 × Berzaghi et al. (2019)		0.085** (0.040)
Constant	0.543*** (0.036)	0.525*** (0.038)
F-test All Topics=0, p-val	0.00	
F-test Clickbait-Incentives X All Topics=0, p-val	0.12	
F-test Viral-Incentives X All Topics=0, p-val	0.68	
F-test Articles=0, p-val		0.00
F-test Clickbait-Incentives X All Articles=0, p-val		0.01
F-test Viral-Incentives X All Articles=0, p-val		0.11
Observations	11,520	11,520
Nr. of receivers	360	360

Notes: This table displays the estimated coefficients from linear regressions on the likelihood that the receiver answers a question correctly in the Knowledge Experiment, when exposed to summaries written by GPT.

Table F.7: LLM Sender - Determinants of Click Rate

	(1)	(2)	(3)
	<b>Likelihood of Receiver Click</b>		
Clickbait-Incentives Summary	0.050** (0.021)	0.050** (0.021)	0.050** (0.021)
Viral-Incentives Summary	0.033 (0.023)	0.033 (0.023)	0.033 (0.023)
Condition with Viral- vs. Info-Inc Summaries	-0.029 (0.023)	-0.032 (0.023)	-0.032 (0.023)
Female receiver		-0.009 (0.016)	-0.009 (0.016)
Age of receiver		0.000 (0.001)	0.000 (0.001)
Social media user		0.039 (0.025)	0.039 (0.025)
College education		0.033** (0.015)	0.033** (0.015)
Constant	0.173*** (0.017)	0.122*** (0.038)	0.165*** (0.044)
Receiver characteristics	No	Yes	Yes
Order FE	No	No	Yes
Observations	2,392	2,392	2,392
Nr. of receivers	299	299	299
Click rate on Info-Incentives Summaries	0.17	0.12	0.16
Click rate on Clickbait-Incentives	0.22	0.17	0.21
Click rate on Viral-Incentives Summaries	0.21	0.16	0.20

*Notes:* This table displays the estimated coefficients from linear regressions on the likelihood that the receiver clicks to read more about a research article when the summaries were written by GPT. The design was the same as in the Click-Knowledge experiment. Robust standard errors, clustered at the receiver level, in parentheses. \* p<.10; \*\* p<.05; \*\*\* p<.01

Table F.8: LLM Sender - Receiver Click Rate - By Topic and Article

	(1)	(2)
	Likelihood Receiver	Clicks to Read More
Clickbait-Incentives	0.097** (0.046)	0.076 (0.070)
Viral-Incentives	0.046 (0.046)	0.016 (0.067)
Cancer	0.005 (0.031)	
Vaccines	-0.103*** (0.027)	
Climate	-0.060* (0.032)	
Clickbait-Incentives Summaries=1 × Cancer	-0.068 (0.061)	
Clickbait-Incentives Summaries=1 × Vaccines	-0.043 (0.051)	
Clickbait-Incentives Summaries=1 × Climate	-0.080 (0.057)	
Viral-Incentives Summaries=1 × Cancer	-0.026 (0.058)	
Viral-Incentives Summaries=1 × Vaccines	-0.024 (0.051)	
Viral-Incentives Summaries=1 × Climate	-0.003 (0.058)	
Gangwisch et al. (2020)		-0.191*** (0.045)
Lee et al. (2019)		0.018 (0.052)
Kim et al. (2019)		-0.198*** (0.045)
Mina et al. (2019)		-0.198*** (0.043)
Hviid et al. (2019)		-0.195*** (0.045)
Maxwell et al. (2019)		-0.199*** (0.044)
Berzaghi et al. (2019)		-0.108** (0.050)
Clickbait-Incentives Summaries=1 × Gangwisch et al. (2020)		0.057 (0.087)
Clickbait-Incentives Summaries=1 × Lee et al. (2019)		-0.148 (0.097)
Clickbait-Incentives Summaries=1 × Kim et al. (2019)		0.061 (0.087)
Clickbait-Incentives Summaries=1 × Mina et al. (2019)		-0.003 (0.081)
Clickbait-Incentives Summaries=1 × Hviid et al. (2019)		-0.037 (0.078)
Clickbait-Incentives Summaries=1 × Maxwell et al. (2019)		-0.023 (0.088)
Clickbait-Incentives Summaries=1 × Berzaghi et al. (2019)		-0.094 (0.082)
Viral-Incentives Summaries=1 × Gangwisch et al. (2020)		0.057 (0.083)
Viral-Incentives Summaries=1 × Lee et al. (2019)		-0.066 (0.095)
Viral-Incentives Summaries=1 × Kim et al. (2019)		0.071 (0.082)
Viral-Incentives Summaries=1 × Mina et al. (2019)		0.004 (0.074)
Viral-Incentives Summaries=1 × Hviid et al. (2019)		0.004 (0.083)
Viral-Incentives Summaries=1 × Maxwell et al. (2019)		0.025 (0.084)
Viral-Incentives Summaries=1 × Berzaghi et al. (2019)		0.029 (0.086)
Condition with Viral- vs. Info-Inc Summaries	-0.032 (0.023)	-0.035 (0.023)
Constant	0.204*** (0.047)	0.300*** (0.058)
F-test All Topics=0, p-val	0.00	
F-test Clickbait-Incentives X All Topics=0, p-val	0.54	
F-test Viral-Incentives X All Topics=0, p-val	0.93	
F-test Articles=0, p-val		0.00
F-test Clickbait-Incentives X All Articles=0, p-val		0.19
F-test Viral-Incentives X All Articles=0, p-val		0.77
Observations	2,392	2,392
Nr. of receivers	299	299

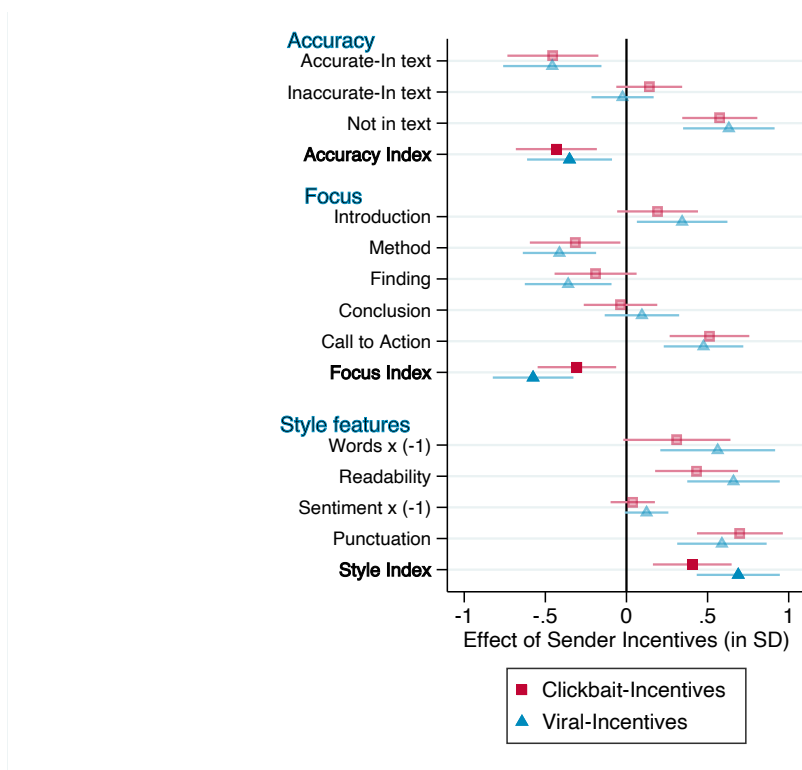
Notes: This table displays the estimated coefficients from linear regressions on the likelihood that the receiver clicks to read more in the Click-Knowledge when the summaries were generated by GPT.

## F.2 LLM as Coder

The content analysis of sender summaries in the main text is based on two independent research assistants. An alternative to these human coders is GPT. To examine the robustness of the findings to an alternative coding entity, we provided the sender summaries to GPT, via its API, and instructed it to code each unit of information. We provided GPT instructions based on those of human coders (shown in Online Appendix G), with examples for units of information that were specific to each article. GPT coded each unit for its accuracy, and separately, also coded each unit according to its focus.

We show in Figure F.2 that the effects of sender incentives on the content of summaries remain qualitatively unchanged.

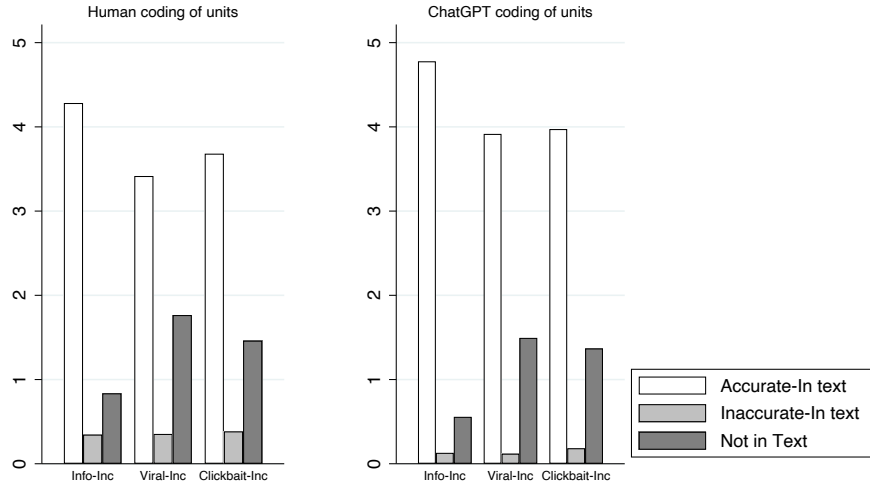
Figure F.2: Effects of Incentives on Senders' Summary: GPT Coding of Units



*Notes:* This figure shows the average treatment effect of Clickbait-Incentives and Viral-Incentives, relative to Info-Incentives, when summaries are coded by an LLM rather than human coders (GPT). The Accuracy panel focuses on summary accuracy: in text-accurate units, in text-inaccurate units, and not in text units in a message. The Focus panel focuses on content: Introduction, Method, Finding, Conclusion and Call to Action units in a message. The Style features results are the same as in the main text (reproduced here for completeness). Error bars correspond to 95% confidence intervals.

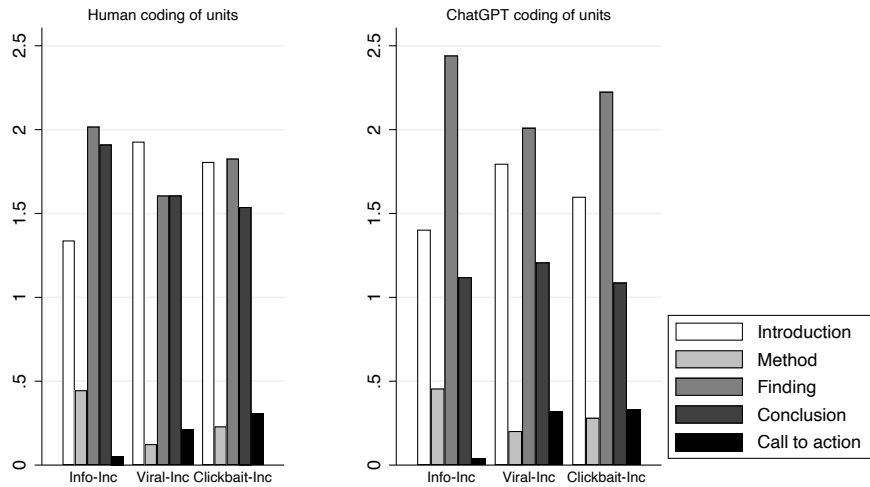
Next, we compare the categorization obtained by human and LLM coding, on average, in Figures F.3 and F.4. While there are differences in the levels, we observe qualitatively similar treatment effects throughout.

Figure F.3: Comparison of Human vs. GPT Coding of Units for Accuracy



*Notes:* This figure shows the average number of units classified as Accurate-In text, Inaccurate-In text, and Not in text by human coders (left) and by GPT (right).

Figure F.4: Comparison of Human vs. GPT Coding of Units for Focus



*Notes:* This figure shows the average number of units classified as Introduction, Method, Finding, Conclusion and Call to Action by human coders (left) and by GPT (right).

## G Text Coding: Instructions for Coders

*Below we present the instructions that (human) coders followed when analyzing the text summaries written by senders.*

### Introduction

In a current study, participants were presented with the abstract and press release of a published research article – we refer to this information as their “materials.” Their task was to write a headline and a 3-sentence summary about the research article. Your task is to code their writing according to the instructions below.

### Coding Steps

There are three steps to coding the writing of participants:

**STEP 1.** Units of information. Variable names for each unit have been created (variable names: “unit1,” “unit2,” “unit3,” etc.). A preliminary split based on punctuation, usually 1 full sentence, is already available. A unit is defined as a statement that conveys a single, identifiable piece of information. Please split units that contain long sentences with multiple identifiable pieces of information into multiple units.

Example:

“There are many more Republican candidates in the presidential race. Many of those running are unknowns or will drop out of the race. Democrats are focusing on a few candidates.”

Coded as having 3 units of information.

“Unit1”: There are many more Republican candidates in the presidential race.

“Unit2”: Many of those running are unknowns or will drop out of the race.

“Unit3”: Democrats are focusing on a few candidates.

**STEP 2.** Type of information. A variable for each unit that classifies the sentence into a type/class (“type1,” “type2,” etc) has been created. According to Munch (2023) there are basically four types of content (and sections) when writing a scientific paper: Introduction, Methods, Results, Discussion. Schimel (2012, Chapter 4) describes “Story Structure.” The structure closest to what is written in the summaries you are coding is provided on page 32, where the parts are Introduction (opening, background and challenge), Materials and Methods, Results and Discussion. Motivated by these references, we will classify the unit into one of 5 categories:

1. “Introduction”: A unit that introduces the topic of the research study. It provides an opening, background, or states a challenge that scientists have experienced thus far. For example, it could state a question, show some past results or relevant studies prior to the present study. It can provide context and/or motivation for it.

Examples: “Are Carbs Ruining Your Sleep?” “Want to Sleep Better?”

2. “Method”: What the researchers did, and how they did it. Sentence that states the sample involved in the research, or states the context in which it was done. In what ways did the researcher recover the finding?

Examples: “After a recent measles outbreak in the Netherlands, a team of international doctors and virologists analyzed the blood of 77 children (sample: 77 children, method: analyzed the blood)”; “These studies were conducted over the course of three nights (Method: how the researcher conducted the study)”; “The study compared the effects of sleeping in gentle rocking and non-rocking beds on 18 healthy young adults (Sample: 18 healthy young adults, method: using comparison to recover the finding).”

3. “Finding”: A unit that provides a finding of the research study (not previous studies). What the study found is described. It must be specific to the study findings (and not a broader implication). When considering whether a headline should be classified as a finding, it should include words like “Study shows” or “Study found” to classify it as finding, as the reader does not otherwise not know that the content is about a research finding – if it does not include those words, we record it as “Introduction.”

4. “Conclusion” (Discussion or Implication): A unit that provides a broader discussion, conclusion, future plans or implication of the research study. It shows what it means, or what is the take home message. For example, the unit could suggest that, building on what has been found, the research could affect other populations or that the findings could lead to XYZ.

Examples: “BigPharma wants to profit from it.” “For A Good Night’s Sleep We Should Be Looking In Our Kitchen Instead Of Our Medicine Cabinet.” “Avoid fruit juices and eat more vegetables and whole fruit with fiber.” “It could be as easy as adding a few extra veggies or a glass of milk at dinner to make the difference between getting or not getting skin cancer.”

5. “CTA” - call to action (read the article or click the link): While these units do not describe the research, we will analyze them separately. Code units like “read on to learn more about this” or hashtags like “#sleep#rocking#memory” as CTA.

**STEP 3.** Source or Accuracy of Information: We have created a variable for each unit (“acc1;” “acc2”) that is to be used to state the source of the content, using one of the categories below.

1. “Not in text”: If the unit of information contains information that was NOT in the materials.

Example: “You may be familiar with rocking a baby to sleep (rocking babies to sleep was never mentioned anywhere)”

2. “In text-Accurate”: If the unit of information contains complete information about an aspect / point / finding that was part of the abstract/press release (i.e. materials the participant had).

3. “In text-Inaccurate-Wrong”: If the unit of information contains information that wrongly reports about the materials (e.g., correlation converted into causation, between-subjects design is reported when it was within-subjects, longitudinal analyses implied when they were not done). There may be correct parts in the unit, but if there is at least one incorrect statement, it is classified as wrong.

On correlation vs. causation: words that indicate one or the other. For a reference, see Haber et al. (2022), who include a long list of words that have a causal or correlational interpretation. Causal interpretation comes from words such as: cause, prevent, affect, lead, impact, produce, result. Correlational interpretation comes from words such as: consistent, correlate, associate, link, relate.

Other examples: Phrases such as: “It is thought”, “It is believed,” which may mislead readers to regard the finding as a rule of thumb can be classified as wrong.

Sometimes the person writes “it is thought that Inaccurate-In text leads to Y.” It is in some cases a proven result, so saying it is “believed” is misleading and wrong. Examples are: “It is also thought to contribute to memory consolidation”, “It is believed that the rocking motion helps to synchronize neural activity in the brain while the volunteers slept.”

4. “In text-Inaccurate-Incomplete”: If the unit of information contains incomplete information about an aspect / point / finding that was part of the materials. It may leave out other findings or details or context of the study. The reason to classify a unit as incomplete would be because what is stated there is very vague or lacks much concreteness.

Two other features of the text to code are: whether the sample is mentioned and whether the headline is a finding.

Sample\_mentioned: Sample is considered as mentioned if it is specific enough relative to the subject of study. For several studies, specific examples are listed below. Coded as 0 if the sample is not mentioned. Enter the “Original text” that mentions the sample (type and numerical/amount). If multiple mentions, they are all included with a semicolon.

Headline\_finding: Coded as 1 if the headline refers to the research finding explicitly: “Study shows...” or “Rocking leads to longer sleep and better memory, study finds,” and 0 otherwise.

## **Additional Specific Coding Decisions Based on the Articles**

### **Perrault et al. (2019)**

Examples of “In text-Inaccurate-Wrong”: If the summary implies a between-subjects design, but it was within subjects, it is considered wrong. If they “conjecture” an effect that has been actually shown (like memory or brain oscillations).

Examples of “In text-Inaccurate-Incomplete”: If finding is “sleep longer” it’s incomplete because the sleep is deeper and has fewer arousals, but the materials do not explicitly state longer.

Examples of “Sample mentioned”: “18 participants”, “18 healthy young participants,” “18 young participants who were good sleepers...”

### **Gangwisch et al. (2020)**

Examples of “Sample mentioned”: “Postmenopausal women,” it is OK if the number of participants is not mentioned. But not that only stating women is not considered as “sample mentioned.”

### **Lee et al. (2019)**

This article is complex, please read carefully the materials provided to the participants. There are several main words used in the paper that you should be familiar with. PTEN is a potent tumor suppressor gene. WWP1 is genetically amplified and frequently overexpressed in multiple cancers, including those of prostate, breast, and liver, which may lead to pleiotropic inactivation of PTEN by producing an enzyme that inhibits PTEN’s tumor suppressive activity. I3C is a small molecule; ingredient in broccoli and other cruciferous vegetables; natural compound. A natural and potent WWP1 inhibitor, by inactivating WWP1 it helps activate PTEN.

Examples of “Sample mentioned”: “cancer-prone laboratory mice and human cells” “Mice” “Human cells.”

Examples of “In text-Inaccurate-Wrong”: “Broccoli can prevent cancer” or calling I3C a chemical (I3C is molecule/compound).

### **Mina et al. (2019)**

Examples of “Sample mentioned”: “77 unvaccinated children,” “4 macaque monkeys” , “A blood analysis of 77 unvaccinated children,” “77 unvaccinated children in the Netherlands.”

### **Hviid et al.(2019)**

Examples of “In text-Accurate”: “Study showing that the rate of autism was the same in both the MMR group and the non-MMR vaccinated group.”

Examples of “In text-Inaccurate-Wrong”: If it claims a causal relationship: “Study showing that MMR (measles, mumps, rubella) vaccine does not cause autism.”

### **Maxwell et al. (2019)**

Examples of “In text-Inaccurate-Incomplete”: Unit does not say the numbers computed for the carbon emissions from intact tropical forest deforestation are underestimated/recalculated/revised.

Examples of “Sample mentioned”: (lost / intact) tropical forests from 2000 to 2013.

## Berzaghi et al. (2019)

Examples of “Sample mentioned”: “African forest”, “field measurements collected in the Congo Basin” and “data from two lowland African primary forests’ inventories.”

## References in Online Appendix

1. Adie, E., and Roe, W. (2013). Altmetric: enriching scholarly content with article-level discussion and metrics. *Learned Publishing*, 26(1), 11-17.
2. Goldstein, J.A., Sastry, G., Musser, M., DiResta, R., Gentzel, M., and Sedova, K. (2023). Generative Language Models and Automated Influence Operations: Emerging Threats and Potential Mitigations, manuscript, arXiv:2301.04246.
3. Haber et al. (2022), “Causal and Associational Language in Observational Health Research: A Systematic Evaluation,” *American Journal of Epidemiology*, 191 (12), 2084-2097.
4. Jennrich, R. I. (1970). An asymptotic  $\chi^2$  test for the equality of two correlation matrices. *Journal of the American Statistical Association* 65: 904–912.
5. Kapoor, S., and Narayanan, A. (2023). How to Prepare for the Deluge of Generative AI on Social Media. A grounded analysis of the challenges and opportunities. Manuscript, Knight First Amendment Institute at Columbia University.
6. Salton, G., and C. Buckley (1988). “Term-weighting approaches in automatic text retrieval.” *Information processing & management* 24.5: 513-523.