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Democratic Consequences of Incidental Exposure to Political Information: A Meta-Analysis

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In the last two decades, communication research dedicated substantial attention to the effects of incidental exposure (IE) to political information. In this meta-analysis, we analyzed the relationship of IE and five outcomes relevant for democracies. Including 106 distinct samples with more than 100,000 respondents, we observed positive cross-sectional relationships between IE and news use, political knowledge, political participation, expressive engagement, and political discussion. These effects shrink substantially but remain significant for panel studies. While we found a stronger relationship with knowledge for experiments compared to surveys, the relationship between IE and discussion and participation was not significant for experiments. Overall, findings suggest that IE matters, but its effects are smaller and more nuanced than previously thought. Also, the effects of IE are strongest when there is congruence between the exposure setting and the outcome setting. We discuss theoretical and methodological implications for IE research and the field at large.

Keywords: Incidental Exposure, Meta-Analysis, News Use, Political Discussion, Political Knowledge, Political Participation, Political Expression

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Most democratic theories rest on the idea that the electorate reads, discusses, and knows about politics (Ferree et al., 2002). In that context, exposure to political news plays a crucial role. However, not all citizens are interested in actively pursuing behaviors that empower them to learn about the political sphere. As a consequence, communication scholars became increasingly interested in unintentional forms of political information consumption (e.g., Tewksbury et al., 2001; Valeriani & Vaccari, 2016). Especially on social media, citizens are likely to encounter political information by chance, that is, without intentionally looking for it.

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This phenomenon, called incidental exposure (IE)–exposure to news that people encounter without actively searching for it–has become increasingly relevant in political communication research. Although the potential positive effects of IE have been noted more than 50 years ago (e.g., Downs, 1957; Krugman & Hartley, 1970), the rise of social media has renewed the interest in the phenomenon of IE. In order to explain how IE shapes civic outcomes, work on IE often draws on passive learning as a theoretical mechanism (e.g., Tewksbury et al., 2001; Valeriani & Vaccari, 2016). However, the current body of research does not allow clear conclusions if and how IE shapes democratic citizenship. While some studies suggest positive effects of IE on knowledge or participation (e.g., Valeriani & Vaccari, 2016), others observed no (e.g., Oeldorf-Hirsch, 2018), or conditional relationships (e.g., Lee & Kim, 2017). Recently, scholars suggested that particularly interested and engaged individuals may experience and profit from IE (e.g., Kümpel, 2020). Thus, a reliance on cross-sectional surveys in the field might disguise whether IE can actually benefit democratic outcomes. In addition, there is a plethora of different outcomes and study designs, and hence, the literature lacks a clear synthesis of the existing evidence.

A meta-analysis on the democratic consequences of IE can advance our understanding of how political information contributes to an active and informed citizenship. First, IE can serve as a gateway to intentional forms of *news use*, as for instance, when individuals stumble upon political information and then turn to intentional forms of news use. In line with that, IE can be theorized to foster *learning of political information* because citizens are exposed to bits of information they were not intentionally looking for. By the same token, IE may affect *political engagement* such as political participation, expression, and discussion, because exposure to new information is a key driver of getting politically involved.

A meta-analysis is a milestone to better understand these outcomes, it helps to systematically examine the conditions for statistical relationships, and it is indispensable for theory building and conceptual development (Rains et al., 2020). It can guide future research in the area toward new questions which have hardly been discussed in previous studies (e.g., comparing different media types on which IE occurs). Furthermore, without relying on potentially subjective narrative reviews or vote counting procedures, a meta-analysis allows researchers to overview the massive bulk of research that has been generated in the last decades based on formal statistical analysis. In addition, a meta-analysis can allow conclusions about the role of different research approaches in observing outcomes of IE. Against this background, we analyzed, for the first time, the entire body of available research on IE, including research from 106 samples, with more than 100,000 respondents.

Conceptualizing incidental exposure

A share of the population is not particularly interested in politics or does not really follow political news. Without active exposure to the political discourse, these

individuals do not encounter opportunities to become engaged or learn about politics. Thus, communication scholars directed their attention to the potentially beneficiary effects of IE. It has been argued that IE may happen through a variety of sources ranging from interpersonal discussion to entertainment media (e.g., Downs, 1957). Particularly after broadcast TV became popular, the mixing of entertainment programs and political information was regarded as a way that can inform less interested parts of the public. However, some argued that the increasing number of TV channels and choices would also allow audiences to avoid opportunities for IE (Prior, 2007). Today, online media offer additional pathways for IE (e.g., Wojcieszak & Mutz, 2009). Particularly, social media users do not have full agency over content selection. Algorithms or network characteristics affect the mash of information (Thorson & Wells, 2016).

Most scholars consider situations in which "people inadvertently consume news and information [. . .] when they are not actively seeking it" (Kim et al., 2013, p. 2608) as IE. Building on this, a few more fine-grained approaches emerged as well (e.g., Kümpel, 2020; Matthes et al., 2020; Wieland & Kleinen-von Königslöw, 2020). In line with previous work, we define IE as consisting of two aspects that are generally agreed upon. First, IE has to be unintentional, that is, encounters with information have to happen without individuals actively looking for the information. Second, given that we are concerned with variables that are related to democratic outcomes, IE refers to exposure to political information. That is, serendipitous encounters with non-political information are clearly not of interest. Thus, we define IE as *exposure to political information that individuals did not intend to be exposed to*.

Effects of incidental exposure

IE has been related to various democratically relevant outcomes: news use (e.g., Strauß et al., 2020), political knowledge (e.g., Lee et al., 2022), political participation (e.g., Heiss & Matthes, 2019), political expression (e.g., Yamamoto & Morey, 2019), and political discussion (e.g., Kwak et al., 2020). In explaining the effects of IE, research builds on established theories of political information processing. For example, the cognitive mediation model (Eveland, 2001) or various forms of the OSROR model (e.g., Cho et al., 2009) are prominently featured in IE research (e.g., Chen et al., 2022; Oeldorf-Hirsch, 2018; Yamamoto & Morey, 2019). Only recently, more nuanced theoretical accounts found their way into the literature (e.g., Kümpel, 2020; Matthes et al., 2020). The Political Incidental News Exposure model (PINE; Matthes et al., 2020), for instance, posits two distinct levels of IE. First-level IE describes the "*passive scanning of information* deemed as irrelevant" (Matthes et al., 2020, p. 1035), while second-level IE refers to the effortful processing of incidentally encountered information appraised as relevant (see also Nanz & Matthes, 2020). When not appraised as relevant (i.e., first-level IE), IE may still affect democratic outcomes because individuals must process at least fragments of the information to

check for its relevance. Theories of passive learning, accessibility or goal-priming can help to understand effects of first-level IE. Yet when individuals appraise IE content as relevant, more attention and cognitive resources are dedicated to the processing of the information. In this case, next to cognitive accessibility, theories of elaboration and intentional learning aid to explain the effects of IE. The model helps to explain why IE may influence news use, political knowledge, political participation, expressive engagement, and political discussion.

News use

It has been argued that IE can act as a catalyst for intentional news use (e.g., Strauß et al., 2020). That is, incidentally encountered information may spark interest, and as a consequence, individuals intentionally tune in for news. In a qualitative study, Boczkowski et al. (2018) report of a young man who "said he regularly visits '9gag . . . and it happened to me a lot that I find out news there . . . [then] I always turn to online newspapers or websites'" (p. 3532). In another study, participants reported that they encountered an interesting story incidentally but did not have the time to read it in a given moment, yet they turned to news media intentionally later (Antunovic et al., 2018). In other words, the quick scanning of incidentally encountered information may catch individuals' attention which urges them to seek out political information (Karnowski et al., 2017). In line with this, a longitudinal experiment by Feezell (2018) suggests that exposure to information about political issues on Facebook can increase issue salience. In summary, IE can raise the awareness for political matters which in turn motivates individuals to subsequently seek out political information intentionally. Thus, we assume:

H1: There is a positive relationship between IE and news use.

Next to offline media, online news media and social media play a considerable role in news diets. Importantly, the hypothesized relationship (H1) between IE and news use may differ for various media. On the one hand, technical affordances may shape such differences. Most social media platforms use algorithms to select the content shown to individuals based on their previous behavior (Thorson & Wells, 2016). Due to algorithmic curation, individuals experiencing IE that click on the content may see additional political content. The increased amount of political news in one's newsfeed can transform the platform into an increasingly suitable way of getting political information intentionally. Thus, especially social media news use might be increased by IE. On the other hand, one could argue that individuals might prefer turning to offline media and online versions of legacy media after IE because these media sources are, by and large, comparatively high in trust. In fact, a Pew poll showed that only 3% have "a lot" and only 31% of users have "some" trust in information from social media (Pew, 2017). Thus, even though IE may raise awareness of political issues, individuals might be inclined to turn to traditional offline media for additional information. Besides, offline media may offer in-depth information,

and thus serve information needs more directly compared to social media. Given these competing theoretical arguments and a lack of prior research (but see Strauß et al., 2020), we state a research question.

RQ1: Does the relationship between IE and news use differ for offline news use, online news use, and social media news use?

Political knowledge

The argument that individuals may accumulate political knowledge through IE has been echoed for decades (e.g., Downs, 1957; Tewksbury et al., 2001). According to Matthes and colleagues (2020), first-level IE, which is the brief scanning of incidentally encountered political information, may lead to learning because parts of the IE content are processed by individuals to determine whether the content is relevant. Scholars often refer to the theory of passive learning (Krugman & Hartley, 1970) to explain why IE can foster the public's political knowledge. Given both, a lack of intention to learn and absence of resistance to learn, individuals may absorb information by passive learning. Experimental research suggests that individuals can recognize IE content even when they were instructed to attend to another task during exposure (Lee & Kim, 2017). Thus, IE can leave memory traces.

Second-level IE may lead to more substantial learning (Nanz & Matthes, 2020). Sometimes individuals are exposed to information that they were not actively looking for but which is relevant for them. In this case, individuals appraise content as relevant and attend to it. For example, incidentally encountered headlines may spark interest while users log into their email accounts and distract from the initial task (checking emails). Second-level IE leads to more intensive processing and elaboration of IE content. In turn, elaboration and thorough processing leads to increased knowledge (e.g., Eveland, 2001). Both paths have not been sufficiently distinguished in prior empirical research on IE which might explain the mixed findings. While some researchers report positive relationships (e.g., Weeks et al., 2022), other find no or even negative relationships (e.g., Oeldorf-Hirsch, 2018). Nonetheless, based on the prior theorizing, we expect that IE has a positive relationship with knowledge.

H2: There is a positive relationship between IE and political knowledge.

Political participation and expressive engagement

Political participation is one of the key outcome variables in research on IE (e.g., Nanz et al., 2020; Valeriani & Vaccari, 2016). On social media, algorithms and other users may supply individuals with mobilizing information tailored to their interests. Previous work particularly draws on theoretical explanations derived from research on intentional news use. Research shows that participation is fostered by (intentional) news consumption because it provides issues for interpersonal discussions and new information that adds to citizen's knowledge (e.g., Cho et al., 2009;

Delli Carpini & Keeter, 1996). Scholars argued that similar effects should occur in case of IE (e.g., Kim et al., 2013; Valeriani & Vaccari, 2016).

Media consumption leads to knowledge gains and higher levels of political knowledge are connected to higher levels of political participation (e.g., Delli Carpini & Keeter, 1996). Other studies explicitly refer to political discussion and expression as mediators leading to political participation (Yamamoto & Morey, 2019). IE may not only increase political participation by providing individuals with (factual) knowledge, it may also foster political discussion and expression, which in turn, drives political participation. As psychological mechanisms, thorough processing of information, goal priming, or agenda-setting may explain the relationship between IE and participation (Feezell, 2018; Knoll et al., 2020). Overall, we expect a positive relationship between IE and political participation.

H3: There is a positive relationship between IE and political participation.

Scholars often distinguish between offline and online acts of participation. While offline participation includes, for example, signing paper petitions or joining protests, online participation encompasses acts like joining online groups that supports political causes or signing online petitions. There are two reasons why we expect that IE's relationship with online participation is stronger than with offline participation. First, online political participation is sometimes described as being connected with less effort than offline participation. Some acts of participation are easier to conduct or more accessible via the internet than in the offline world. For example, sending a written letter might need more resources (e.g., stamp, time) than sending a message to a politician via social media.

Second, when individuals experience IE in an online environment, they are often simultaneously presented with opportunities that can qualify as online participation (e.g., signing online petitions, contacting a politician). In contrast to offline participation, individuals often do not have to leave the situation in which IE occurred (e.g., they must not leave the house, put down their mobile phones) in order to participate online.

H4: The relationship between IE and online political participation is stronger than the relationship between IE and offline political participation.

A related but distinct democratic outcome encompasses expressive acts such as sharing political news or opinion expression on social media. Building upon the refined "conceptual map of political participation" by Theocharis and van Deth (2018), we distinguish between behavior which we will call *expressive engagement* and *political participation* in this article. Theocharis and van Deth (2018) distinguish between *targeted* definitions of participation, which align closely with more traditional definitions of political participation (e.g., Brady, 1999), and *circumstantial* definitions that account for the context and motivation of a given behavior. While we consider acts targeted at political actors, community problems and, more

generally, the political sphere (i.e., targeted definition) as political participation, we label acts to which the circumstantial definition applies (i.e., political context or motivation) as expressive engagement (e.g., sharing political news, posting political thoughts). Even though some researchers doubt the real-world impact of expressive engagement (for a review, see Skoric, 2012), expressive behavior itself is believed to have substantive effects on various antecedents (e.g., attitude strength, clarity; Pingree, 2007) of more impactful participation. In general, we expect that similar mechanisms as described above for participation should be responsible for a positive relationship between IE and expressive engagement. Namely, IE may foster antecedents of expression such as awareness and knowledge about political topics.

H5: There is a positive relationship between IE and expressive engagement.

Ranging from wearing buttons of a party to sharing personal political experiences on social media, researchers have operationalized various acts of expressive engagement (Heiss & Matthes, 2019; Lee & Xenos, 2022). Differentiating between these forms may be crucial when the potential political impact is considered. For example, writing a lengthy post about one's policy stances on social media—and thereby putting substantial effort in message composition—might affect subsequent behaviors more intensively than merely passing on a link (Pingree, 2007). To our knowledge, there is not sufficient theorizing about differential relations between IE and these types of expressive engagement. Thus, we ask:

RQ2: Does the relationship between IE and different forms of expressive engagement differ?

Political discussion

Given that the idea of a "new" public sphere created by the internet and social media (e.g., Dahlgren, 2005) was (and is) highly influential for research on IE, we believe that it makes sense to distinguish between political discussion and forms of expressive engagement. "[R]esearch has largely conceived of political discussion as an informal, voluntary communicative interaction between ordinary citizens" (Cho, 2015, p. 1). Thus, while engaging in a political discussion must always be accompanied with some form of political expression, *expression can occur without one of the core features of political discussion*. We argue that mere expression lacks "the opportunity for discussants to be exposed to other opinions and values" (Stromer-Galley, 2017, p. 841) in an interactive manner. Theoretical accounts on expression mainly focus on the effects on the sender (Pingree, 2007). However, the deliberative potential of political discussion stems not only from expression effects but also the free flow of thoughts between individuals and the critical examination of arguments from other discussants (i.e., discursive interaction).

Although most studies conceptualize political discussion as a mediator between IE and political knowledge or participation, it makes sense to look at political

discussion on its own. Similar to the rationale regarding participation and expressive engagement, theoretical explanations for a relationship between IE and discussion are rooted in news consumption research. Various studies showed that intentional news use fosters political discussion (e.g., Mondak, 1995). Similarly, OSROR models expect that an individual's news consumption is a predictor of political discussion (Cho et al., 2009). Media use can "provide the basis for political discussion" (Shah et al., 2005, p. 535). For example, the consumption of political information can hand individuals content they can discuss about in their network. Thus, IE to political information may also motivate individuals to discuss political issues (Ardèvol-Abreu et al., 2019). Overall, there are strong theoretical arguments that IE should be positively related to political discussion.

H6: There is a positive relationship between IE and political discussion.

Media types

Researchers discussed IE on offline media (e.g., Barnidge, 2020), online media (e.g., Tewksbury et al., 2001), and social media (e.g., Lee, 2018). TV viewers may incidentally watch news updates in a football game's half time break, internet users may stumble upon political headlines while visiting their email provider's website, and social media users can come across a friend's political post while they are looking for updates on their hobbies. However, to our knowledge, hardly any study considered that the relationship of IE with various outcomes may differ depending on the media on which IE is experienced. The majority of studies on IE looked at only one media or even mixed multiple media types into one scale (e.g., Park, 2019). In Oeldorf-Hirsch's (2018) study, respondents reported equally high IE scores for multiple sources—including online, social, and traditional media. However, just the prevalence of IE (i.e., whether individuals experience more IE via one media type than the other) does not necessarily affect the effect's magnitude. Next to other factors, the characteristics of the political content available (e.g., length, emotionality), the consumption situation (e.g., couch, in the bus), and various attitudes and behaviors (e.g., likelihood of second-level IE) connected to using a certain media type may influence the relationship.

Clearly, several explanations for differences between the media types are possible. TV, newspapers, and radio could promote learning more than online and social media by offering a larger share of factual information. In contrast, social media and the internet may offer more opportunities (e.g., clicking on links) to engage with and elaborate on IE content than linear media. To our knowledge, there is no previous theorizing about this. Because the current research does not allow us to state hypotheses regarding media types, we ask:

RQ3: Do the relationships between (a) news use, (b) political knowledge, (c) political participation, (d) expressive engagement and (e) political discussion and IE online, IE on social media, and IE offline differ?

Methodological characteristics

Public opinion scholars noted that typical (survey) experiments may lead to larger effect sizes than researchers find in the real-world (e.g., Barabas & Jerit, 2010; Gaines et al., 2007). There are also multiple reasons for this assumption when it comes to the comparison between experiments manipulating IE and survey research on IE. First, experiments may use unrealistically strong treatments. For example, experiments might expose respondents to a limited set of content within a timeframe of 15 minutes before assessing the dependent variable. However, on a given day, individuals may encounter hundredths of pieces of information. Some of them might even contradict each other. Second, experiments lack the randomness of actual exposure to content that can be theoretically expected to affect the dependent variable. For instance, survey respondents can encounter a lot of political information incidentally but may not see a specific piece of information (e.g., an article mentioning the unemployment rate) that can be expected to affect the dependent variable (e.g., knowing the unemployment rate). Thus, we state the following hypothesis.

> *H7: The relationship between IE and (a) news use, (b) political knowledge, (c) political participation, (d) expressive engagement, and (e) political discussion are larger in experiments than in cross-sectional surveys.*

In general, the question of causality is a reoccurring issue in meta-analyses. Great reliance on cross-sectional research may lead to an overestimation of effects. For example, a substantial share of a correlation between the independent and the dependent variable could be due to a third variable (e.g., political interest) that affects both variables. Unfortunately, testing cross-sectional coefficients against panel coefficients can be problematic (see Online Appendix F). Additionally, finding evidence that longitudinal studies produce smaller effect sizes than cross-sectional ones would not necessarily render the effect inconsequential, trivial, or meaningless. Thus, in RQ4, we specifically ask whether estimates which account for the level of the dependent variable in the prior wave are statistically distinguishable from zero.

> *RQ4: Is there a positive effect of IE on (a) news use, (b) political knowledge, (c) political participation, (d) expressive engagement, and (e) political discussion for semipartial correlations stemming from panel surveys?*

Method

Study retrieval and selection

We conducted a systematic search in June 2021 in the following databases: Web of Science, Communication and Mass Media Complete, ScienceDirect, PsycInfo, and Scopus.[1] Additionally, we checked the manuscripts' references, web pages of scholars, reviewed all papers citing the influential paper by Tewksbury et al. (2001) on Google Scholar, and screened the program of the last two annual conferences of

ICA, APSA, and AEJMC. In sum, we found 866 results. After removing duplicates, a list of 572 records remained.

A figure laying out the steps for study selection is available in Online Appendix A. In the first step, we excluded records that (a) did not use survey or (quasi-)experimental designs, (b) were not in English or German, and (c) were clearly unrelated to our research goal.[2] Based on these criteria, we excluded 351 studies.[3] The second step concerned three aspects. First, the remaining records were reviewed and all records unrelated to our research interest were discarded. Second, the operationalization of IE must be a measure for or manipulation of exposure to political information or news. Multiple studies discuss IE in the hypothesis section but operationalized general media use variables. Such studies were excluded, because these measures are clearly uninformative about IE.[4] Similarly, studies that did not explicitly refer to IE to political information, news, or public affairs were excluded. Third, the operationalization of IE must clearly portray the incidental nature of the information encounter. We only included operationalizations and measures that clearly depicted that information encounters were *unintended*.[5] Experiments that (a) made sure that respondents pursued a task or goal unrelated to the IE content during exposure, (b) showed respondents a stimulus with at least 50% non-political content (e.g., Bode, 2016), or (c) were a field experiment and manipulated the (amount of) exposure to political information were not discarded (e.g., Feezell & Ortiz, 2021).[6] In the second step, we excluded 159 records.

In the final step, we excluded 16 records that used samples that were already in our database but did not add to the number of coefficients.[7] Then, we contacted all authors from which we needed additional information. In eight cases, authors did not provide the requested information or did not respond to our request. In the third step, 24 studies were excluded because of (a) duplicated samples or (b) missing statistical data. Additional to the samples featured in the 38 records,[8] we searched Pew's website for additional samples including IE measures. We found six samples not featured in any of the records (see Online Appendix G). This meta-analysis builds upon statistical information from 106 distinct independent samples.

Retrieving and calculating effect sizes

We used Pearson's *r* and semipartial correlation *sr* as effect sizes. A positive *r* respectively *sr* indicates that (more) IE is related to a higher score on the dependent variables. At first, we identified all relevant variables for each sample. Few papers linked to open data or reported all information necessary for inclusion. For all the other records, we contacted the authors and asked them to provide additional statistical information. For some studies, we calculated the statistical information on our own. We calculated *r* for all relationships. For panels, we additionally calculated *sr*. Details regarding the process of retrieving and calculating effect sizes are available in Online Appendix C.

Moderators

Variation in the dependent variable

We coded five different types of news use: Offline news use (e.g., TV news, print newspaper, radio), online news use (e.g., online newspapers, news aggregators, "getting news in the internet"), social media news use (e.g., getting news from Facebook), mixed news use (i.e., items measuring online *and* offline news use; e.g., "did you read the newspaper online or offline?"), and other forms of news use (e.g., time used to get news, getting news in person). The last category was not included in the moderator analysis due to substantial heterogeneity in measurement. For samples assessing political participation[9], we distinguish between two measures of participation: Online and offline participation. For expressive engagement, we distinguish between offline acts (e.g., wearing a button of a party), consumerism, political expression involving message composition, and sharing of political information (see Online Appendix E for details).

Media of incidental encounters

We coded four categories to distinguish different media types to which the IE measure referred to: offline IE (e.g., TV, print newspapers, and radio), online IE (e.g., websites or "internet"; we also included scales that mixed various online media sources next to social media items in this category), IE on social media (e.g., Facebook, Twitter), and other forms (e.g., in person, no media mentioned, scales that mix online and offline media). The last category was excluded from the moderator analysis.

Design

We distinguish survey samples ($n = 41$ cross-sectional; $n = 46$ at least some panel coefficients), and (quasi-)experimental samples ($n = 19$).

Analysis procedure

Since the five outcome variables are distinct, we conducted five separate meta-analyses. All analyses were conducted in R with the package *metafor* (Viechtbauer, 2010). We converted *r* and *sr* to Fisher's *z* (Zr; Borenstein et al., 2009; Card, 2012). We present Fisher's *z* next to *r*, respectively *sr*, which was converted back from Fisher's *z* after the analysis using the formula by Lipsey and Wilson (2001). Given that our data are nested,[10] we ran multi-level meta-analyses (Assink & Wibbelink, 2016).[11] Along the average effect size, we also present the I^2 and *Q* statistics (Borenstein et al., 2009).[12] For the moderator analyses,[13] we added fixed-effects to the random-effects model used for the overall effect analyses. Running multi-level meta-analysis is one but not the only recommended way to account for dependent effect sizes in meta-analyses. Thus, we checked the robustness of all our hypothesis and RQ tests by recalculating the models with robust variance estimates (RVE; *metafor*'s robust function; Hedges et al., 2010). In case, the results differed, we reported this in the text.

Some meta-analysts recommend against including different types of effect sizes into one analysis (e.g., Aloe & Thompson, 2013). Thus, in the first set of analyses, we used the cross-sectional correlation between the dependent from W1 and the IE measure from W1 for panel surveys. For RQ4, we re-ran the overall effect size analyses with panel surveys only using the semipartial correlation as effect size.[14] For a publication bias analysis, we present fail-safe N,[15] funnel plots[16] (in Online Appendix A), and Egger's regression test (Egger et al., 1997). Prior to the publication bias analysis, we calculated a weighted mean for each study that reported multiple effect sizes due to conflicting recommendations how these typical methods investigating publication bias can be applied to multi-level meta-analyses.

Results

In the overall effect analysis for news use, we found a positive relationship, $r = .26$, $Zr = 0.26$, $p < .001$ (95% CI = [0.20, 0.33]). H1 was supported. We found significant heterogeneity ($Q(669) = 19172.47$, $p < .001$). Total variability was due to within-study ($I^2 = 53.06\%$) and between-publication variability ($I^2 = 44.57\%$). In RQ1, we asked whether the effect of IE differ for offline news use, online news use, and social media news use. A moderator analysis yielded significant differences ($\chi^2(3) = 87.16$, $p < .001$). We found the largest effect sizes for social media news use ($r = .36$, $Zr = 0.37$, 95% CI [0.30, 0.45]). This relationship was significantly larger than the one with online news use ($r = .29$, $Zr = 0.30$, 95% CI [0.23, 0.37]; $z = -3.94$, $p < .001$), offline news use ($r = .19$, $Zr = 0.20$, 95% CI [0.13, 0.26]; $z = -8.69$, $p < .001$), and the mixed category ($r = .25$, $Zr = 0.25$, 95% CI [0.17, 0.33]; $z = -4.61$, $p < .001$). IE and online news use were more strongly related than IE and offline news use ($z = -5.41$, $p < .001$). The other comparisons did not yield significant differences.

Turning to political knowledge, we found a positive and significant relationship, $r = .11$, $Zr = 0.11$, $p < .001$ (95% CI = [0.05, 0.17]). H2 was supported. We found significant heterogeneity ($Q(112) = 1736.31$, $p < .001$; I^2 level 2 = 41.1%, I^2 level 4 = 54.96%).

For political participation, we found a positive relationship with IE, $r = .13$, $Zr = 0.13$, $p < .001$ (95% CI = [0.08, 0.18]). H3 was supported. We found significant heterogeneity, ($Q(493) = 9881.96$, $p < .001$; I^2 level 2 = 38.8%, I^2 level 3 = 12.87%, I^2 level 4 = 45.02%) A moderator analysis ($\chi^2(1) = 9.75$, $p = .002$) showed that IE affects online participation ($r = .17$, $Zr = 0.17$, 95% CI [0.11, 0.23]) significantly stronger than offline participation ($r = .12$, $Zr = 0.12$, 95% CI [0.07, 0.17]). H4 was supported. However, this finding was not fully robust, given that the moderation did not remain significant when using RVE.

In line with H5, we found a positive relationship with expressive engagement, $r = .23$, $Zr = 0.23$, $p < .001$ (95% CI = [0.16, 0.30]). We found significant heterogeneity, ($Q(310) = 12654.21$, $p < .001$; I^2 level 2 = 57.7%, I^2 level 3 = 15.98%, I^2 level 4 = 24.41%). We ran a moderator analysis for RQ2, yielding significant results

($\chi^2(3) = 10.57$, $p = .014$). The relationship of IE with offline expression ($r = .10$, $Zr = 0.10$, 95% CI [−0.02, 0.21]) was significantly smaller than the one with online expression ($r = .24$, $Zr = 0.24$, 95% CI [0.17, 0.32]; $z = 2.88$, $p = .004$) and sharing ($r = .24$, $Zr = 0.25$, 95% CI [0.17, 0.33]; $z = 2.85$, $p = .004$). The other comparisons did not yield significant differences.

For political discussion (H6), we also found a positive relationship with IE, $r = .22$, $Zr = 0.22$, $p < .001$ (95% CI = [0.16, 0.29]). Again, significant heterogeneity was found ($Q(108) = 6186.95$, $p < .001$; I^2 level 2 = 75.69%, I^2 level 4 = 22.46%).

We ran five moderator analyses with respect to the media type on which IE happened (RQ3). We found a significant moderation for news use (RQ3a, $\chi^2(2) = 12.83$, $p = .002$). A post-hoc comparison showed that offline IE ($r = .18$, $Zr = 0.18$, 95% CI [0.09, 0.27]) affected news use less than IE on social media ($r = .27$, $Zr = 0.28$, 95% CI [0.20, 0.36]; $z = -2.89$, $p = .004$) and online IE ($r = .26$, $Zr = 0.27$, 95% CI [0.19, 0.35]; $z = -3.32$, $p < .001$). Turning to expressive engagement (RQ3d), we found a significant moderation effect ($\chi^2(1) = 16.30$, $p < .001$). We found a significant difference for social media IE ($r = .29$, $Zr = 0.30$, 95% CI [0.23, 0.38]) and online IE ($r = .13$, $Zr = 0.13$, 95% CI [0.05, 0.21]; $z = 4.04$, $p < .001$). For the other outcomes, we did not find differences regarding the media type on which IE occurred (political knowledge (RQ3b): $\chi^2(1) = 1.51$, $p = .220$; participation (RQ3c): $\chi^2(1) = 0.36$, $p = .547$; discussion (RQ3e): $\chi^2(1) = 0.12$, $p = .726$).

H7 expected that the relationship between IE and the five democratic variables should be larger for experiments than surveys. Due to the lack of experiments measuring expressive engagement and news use, we tested this hypothesis only for the other three variables. Moderator analyses presented in Table 2 show that experiments report larger effect sizes than surveys for political knowledge ($\chi^2(1) = 10.44$, $p = .001$). H7b was supported. We found smaller estimates for experiments than surveys measuring discussion and participation. H7c and H7e were rejected. The moderator analyses for discussion ($\chi^2(1) = 3.81$, $p = .051$) and participation ($\chi^2(1) = 2.55$, $p = .110$) were not significant—even though this finding is not fully robust given that both moderator analyses were significant when we used RVE. Notably, the subgroup estimates for experiments measuring discussion ($r = .05$, $Zr = 0.05$, 95% CI [−0.14, 0.23]) and participation ($r = .00$, $Zr = 0.00$, 95% CI [−0.16, 0.17]) were both not significant. In the next analysis for RQ4, we only used semipartial correlations from panel surveys (see Table 3). Even in panel surveys, IE had a positive effect on all five dependent variables (news use: $r = .05$, $Zr = 0.05$, $p < .001$ (95% CI = [0.03, 0.07]); political knowledge: $r = .02$, $Zr = 0.02$, $p = .012$ (95% CI = [0.004, 0.03]); political participation: $r = .05$, $Zr = 0.05$, $p < .001$ (95% CI = [0.03, 0.08]); expressive engagement: $r = .07$, $Zr = 0.07$, $p < .001$ (95% CI = [0.04, 0.10]); political discussion: $r = .10$, $Zr = 0.10$, $p < .001$ (95% CI = [0.05, 0.15])). Semipartial and bivariate correlations are both constrained between 0 and 1. We can observe that the effect sizes for panels were substantially smaller than the ones from cross-sectional studies.

Table 1 Overall Effect Size Analysis for the Relationship between IE and News Use, Political Knowledge, Political Participation, Expressive Engagement, and Political Discussion

	Number of										I^2 for[a]		
Outcome	*Res.*	*ES*	*Stu.*	*Pub.*	*r*	*Zr*	*95% CI*	*Z*	*p*	*Q*	*Level 2 (%)*	*Level 3 (%)*	*Level 4 (%)*
News use	77,502	670	88	27	.26	0.26	[0.20, 0.33]	7.73	<.001	19172.47	53.06***	0.00	44.57***
Political knowledge	50,707	113	66	27	.11	0.11	[0.05, 0.17]	3.51	<.001	1736.31	41.10***	0.00	54.96**
Political participation	62,181	494	54	22	.13	0.13	[0.08, 0.18]	4.86	<.001	9881.96	38.80***	12.87***	45.02***
Expressive engagement	52,017	311	47	18	.23	0.23	[0.16, 0.30]	6.50	<.001	12654.21	57.70***	15.98***	24.41*
Political discussion	63,916	109	58	23	.22	0.22	[0.16, 0.29]	6.60	<.001	6186.95	75.69***	0.00	22.46***

Note. Res. = number of respondents; ES = number of effect sizes; Stu. = number of studies; Pub. = number of publication clusters; r = correlation (calculated from Zr); Zr = Fisher's Z; 95% CI = 95% confidence interval for Zr; $Z = Z$ test value; $p = p$-value; Q = weighted squared deviations from the mean; I^2 = proportion of variance for the respective level.

[a]stars denote significance level of the log-likelihood test comparing the final model with a model with s^2 constrained to zero for the respective level.

***$p < .001$, **$p < .01$, *$p < .05$.

Table 2. Moderator Analyses

		Estimate for moderator level				Moderator analysis			
	k	r	Zr	95% CI	p	Est.	95% CI	test	p
News use								χ^2 (3) = 87.16	<.001
Offline news use	191	.19	0.20	[0.13, 0.26]	<.001				
Online news use	173	.29	0.30	[0.23, 0.37]	<.001	0.10	[0.07, 0.14]		
Social media news use	151	.36	0.37	[0.30, 0.45]	<.001	0.18	[0.14, 0.22]		
Mixed news use	131	.25	0.25	[0.17, 0.33]	<.001	0.06	[-0.00, 0.11]		
Political participation								χ^2 (1) = 9.75	.002
Online participation	73	.17	0.17	[0.11, 0.23]	<.001				
Offline participation	385	.12	0.12	[0.07, 0.17]	<.001	−0.05	[−0.08, -0.02]		
Expressive engagement								χ^2(3) = 10.57	.014
Offline	14	.10	0.10	[−0.02, 0.21]	.097				
Consumerism	38	.20	0.20	[0.11, 0.29]	<.001	0.10	[−0.01, 0.22]		
Online Expression	159	.24	0.24	[0.17, 0.32]	<.001	0.15	[0.05, 0.25]		
Sharing	100	.24	0.25	[0.17, 0.33]	<.001	0.15	[0.05, 0.26]		
News use								χ^2(2) = 12.83	.002
Online IE	197	.26	0.27	[0.19, 0.35]	<.001				
Social media IE	178	.27	0.28	[0.20, 0.36]	<.001	0.01	[−0.05, 0.07]		
Offline IE	90	.18	0.18	[0.09, 0.27]	<.001	−0.09	[−0.14, -0.04]		
Political knowledge								χ^2(1) = 1.51	.220
Online IE	35	.15	0.15	[0.06, 0.24]	.002				
Social media IE	35	.10	0.10	[0.01, 0.18]	.021	−0.05	[−0.13, 0.03]		
Political participation								χ^2(1) = 0.36	.547
Online IE	83	.15	0.15	[0.07, 0.23]	<.001				
Social media IE	139	.12	0.12	[0.06, 0.19]	<.001	−0.03	[−0.12, 0.06]		

Continued

Table 2. Continued

		Estimate for moderator level				Moderator analysis			
	k	r	Zr	95% CI	p	Est.	95% CI	test	p
Expressive engagement								$\chi^2(1) = 16.30$	<.001
Online IE	65	.13	0.13	[0.05, 0.21]	.002				
Social media IE	94	.29	0.30	[0.23, 0.38]	<.001	0.17	[0.09, 0.26]		
Political discussion								$\chi^2(1) = 0.12$	.726
Online IE	24	.20	0.21	[0.10, 0.32]	<.001				
Social media IE	50	.23	0.23	[0.14, 0.31]	<.001	0.02	[−0.11, 0.15]		
Political knowledge								$\chi^2(1) = 10.44$	.001
Cross-sectional	92	.05	0.05	[−0.01, 0.12]	.123				
Experiment	21	.21	0.22	[0.13, 0.30]	<.001	0.17	[0.07, 0.27]		
Political participation								$\chi^2(1) = 2.55$	.110
Cross-sectional	489	.14	0.14	[0.09, 0.19]	<.001				
Experiment	5	.00	0.00	[−0.16, 0.17]	.982	−0.14	[−0.31, 0.03]		
Political discussion								$\chi^2(1) = 3.81$	.051
Cross-sectional	103	.24	0.24	[0.18, 0.31]	<.001				
Experiment	6	.05	0.05	[−0.14, 0.23]	.623	−0.19	[−0.39, 0.00]		

Note. k = number of effect sizes; r = correlation (calculated from Zr); Zr = Fisher's Z; 95% CI = 95% confidence interval for Zr; $p = p$-value; est. = estimate of moderator level in comparison to reference level; 95% CI = 95% confidence interval for estimate; test = Omnibus test of moderators; $p = p$-value for omnibus test.

Table 3 Overall Effect Size Analysis for the Relationship between IE and News Use, Political Knowledge, Political Participation, Expressive Engagement, and Political Discussion with Semipartial Correlations (sr) from Panels

	Number of										
Outcome	Res.	ES	Stu.	Pub.	*sr*	*Zr*	95% CI	*Z*	*P*	*Q*	I^2 (%)
News use	30,492	356	48	12	.05	0.05	[0.03, 0.07]	5.22	<.001	642.96	49.25
Political knowledge	21,224	54	28	8	.02	0.02	[0.004, 0.03]	2.50	.012	131.59	58.70
Political participation	6,512	109	11	7	.05	0.05	[0.03, 0.08]	3.91	<.001	234.80	54.32
Expressive engagement	6,933	87	12	8	.07	0.07	[0.04, 0.10]	4.36	<.001	331.82	73.90
Political discussion	6,489	25	11	8	.10	0.10	[0.05, 0.15]	3.77	<.001	146.13	85.18

Note. Res. = number of respondents; ES = number of effect sizes; Stu. = number of studies; Pub. = number of publication clusters; *sr* = semipartial correlation (calculated from *Zr*); *Zr* = Fisher's *Z*; 95% CI = 95% confidence interval for *Zr*; *Z* = *Z* test value; *p* = *p*-value; *Q* = weighted squared deviations from the mean; I^2 = sum of proportion of variance for level 2, 3, and 4 combined.

Finally, we turn to publication bias analysis for which we averaged the bivariate effect sizes for each dependent variable per study. Funnel plots are available in Online Appendix A. None of the five Egger's regressions was significant (news use: $t(85) = 1.77$, $p = .080$; knowledge: $t(63) = 1.12$, $p = .269$; participation: $t(51) = -0.09$, $p = .932$; expressive engagement: $t(44) = 0.88$, $p = .385$; discussion: $t(55) = -1.43$, $p = .159$). We found extremely large fail-safe *N*s for some of the five dependent variables (news use: 114,379; knowledge: 8,002; participation: 20,484; expressive engagement: 33,679; discussion: 76,076).

Discussion

In this meta-analysis, we reviewed the current body of research on the effects of IE on five outcomes key to modern democracy. There are four main findings. First, our results amplify concerns about cross-sectional research. To reiterate, cross-sectional studies should be treated with caution because findings could be spurious and the causal order is unclear. This matter is alleviated given that particularly individuals that are already politically interested and engaged may experience more IE (see e.g., Kümpel, 2020). Specifically, on social media, highly interested individuals might be entangled in a positive feedback loop[17] with the algorithmic system that flushes more and more relevant IE content into their newsfeed (see e.g., Thorson et al., 2021) which in turn is more likely to lead to second-level IE. In the meantime, individuals that mainly stay in first-level IE may have over time even less opportunities

for IE due to the lack of positive feedback (e.g., clicking on posts) for the algorithm. Including panel surveys into the meta-analysis allowed us to calculate semipartial correlations which control for the level of the dependent variable in W1. Even though, the overall effect size analyses with bivariate correlations from cross-sectional data as well as the analyses with semipartial correlation stemming from panel surveys yielded significant results for all five outcomes, the magnitude of the effect size estimate differ substantially. While we find rather strong relationships between IE and news use ($r = .26$), expressive engagement ($r = .23$), and political discussion ($r = .22$) and slightly smaller relationships for political participation ($r = .13$) and political knowledge ($r = .11$) in the cross-sectional data. The meta-analytic analysis of panel data shows that only fractions of these relationships remain. Clearly, smaller effect sizes in longitudinal studies are not particularly surprising. Furthermore, small effect sizes may still be relevant and consequential in the long term. However, since the effect sizes are small, an overly optimistic perspective arguing that IE can bring new live to democracies struggling with an uninterested and unengaged electorate is not fully supported by our data.

Second, and irrespective of the causal nature of the relationships, we found evidence that the media type on which IE occurs matters for some of the outcomes. Compared to IE happening via offline media, IE on social media as well as online IE displayed the largest relationships with intentional news use. The reason may be that online platforms curate the content based on previous behaviors (Thorson & Wells, 2016). Also, users can personalize most of their favorite websites and self-select their networks on social media. Such personalized content selection processes may prioritize content perceived as particularly relevant, making subsequent thorough processing more likely. In the language of the PINE model (Matthes et al., 2020), IE in the online realm makes it more likely that IE content is appraised as relevant (i.e., second-level IE) compared to offline media IE. Also, internet content might, in many instances, elicit more emotions compared to offline media (see Knoll et al., 2020). Interestingly, when it comes to expressive engagement, we even found a stronger relationship for IE on social media than for online IE. In other words, particularly IE on social media leads to political expression. One may explain this with the fact that individuals experiencing IE on social media do not have to leave the reception situation (e.g., leave the social media app) to express their thoughts or share their position.

Additional analyses crossing the variation in the dependent variable (e.g., online–offline distinction for participation) with the media type of the independent variable (e.g., online IE, offline IE; see online Appendix F) revealed that the congruence between media type of IE and the dependent variable seems to matter. While it may not be a major surprise that IE on a media platform is more strongly related to behaviors that are related to this media platform, this aspect has been neglected in the previous literature even though, it may have substantial implications. For example, if IE on social media primarily increases intentional news consumption on social media but not more traditional forms of news use, potentially negative

consequences of social media news use (e.g., having the "feeling" of being informed without actual learning, see e.g., Schäfer, 2020) should be considered in research. This also offers new and more complex theoretical perspectives on the effects of IE. For example, it could be hypothesized that the existence of learning effects instigated by IE on social media are contingent on the mode of news consumption individuals engage in after experiencing IE.

On a related note, we found that IE had a larger effect size for online than offline participation—even though, this finding was not fully robust. Potentially, multiple paths characterized by different information processing strategies may lead to different forms of participation. According to the PINE model, first-level IE may instigate online acts of participation that are accessible to individuals right after exposure (e.g., links to online petitions). Subsequently, such online participation may translate into offline forms of participation. Second-level IE may even affect acts of participation that are more distant from the reception situation or more effortful directly (Matthes et al., 2020). Panel studies with more than two waves could help to answer these questions.

Third, while comparing survey with experimental designs, we find some discrepancies regarding the literature's main message. We will first turn to the seemingly special case of political knowledge. While the meta-analysis revealed a very modest relationship between IE and knowledge in surveys ($r = .05$, $sr = .02$), we find a comparatively large estimate for experimental research ($r = .21$). One possible explanation is that individuals experiencing IE do not encounter the political information scholars typically ask for in knowledge batteries. Tracking data that also relies on screen capture combined with content analysis may resolve this discrepancy. Interestingly, we did not find a positive relationship between IE and political discussion and political participation in experimental research. The lack of a positive relationship is surprising in light of the substantial effect size we found for political knowledge in experiments and opens up a new research gap. During the coding of studies, we noticed that most experimental work assesses whether individuals (intend to) participate or discuss a specific issue (e.g., healthcare). According to the PINE model, the relevance of an IE topic matters for the effects. Thus, incorporating data on the (perceived) relevance of the IE topic could explain the null finding or even reveal a moderated relationship.

Fourth, we noticed an almost alarming degree of variation in the labeling and measurement of some of the core outcomes in the field. Particularly, forms of expression, discussion, and participation are sometimes thrown together. For example, while some studies explicitly operationalize political expression or political discussion, other studies use almost identical items to assess political participation. In short, the field uses similar items to measure different concepts, but simultaneously uses similar items to measure variables that are then labeled differently. This also concerns our own work (e.g., Nanz et al., 2020). Additionally, double-barred questions mentioning behaviors falling into different dependent variables are also a reoccurring theme in the literature (see online Appendix E for examples). We applied

great caution and a prominent theoretical framework (Theocharis & van Deth, 2018) to guide us out of this clutter for this meta-analysis. However, future research must apply more scrutiny regarding measuring and labeling these key concepts of communication research.

Limitations

Some limitations should be noted. First, a substantial share of studies included in this meta-analysis use survey methods. Self-report measures for exposure should always be analyzed with caution given that recalling IE can be biased. This limitation of the primary studies partially extends to this meta-analysis as well. Second, the media type category IE via offline media is very rare in our meta-analysis, allowing us only to test RQ3a with offline IE as a moderator category. Third, we only examined research in two languages. Fourth, unpublished studies may not be found through the databases we used. These limitations notwithstanding, our sample compares well to prominent meta-analyses in the field.

Theoretical and methodological implications

In this meta-analysis, we found that IE can affect political outcomes such as participation, discussion, expressive engagement, and knowledge. Putting the comparison of the magnitude aside, these relationships are quite similar to what has been documented for (intentional) news exposure for decades. In the beginning of this article, we also extensively documented that IE researchers often build their reasoning upon the empirical and theoretical work on (intentional) news exposure. Thus, readers may wonder: what makes IE different from intentional news consumption? The current literature mentions multiple reasons why IE is worth studying. For example, some scholars argue that IE in the Internet may reach parts of the population that would otherwise not be confronted with politics (i.e., individuals that do not consume political information actively). Relatedly, scholars argued that IE may have become one of the most important ways individuals encounter news nowadays. In other words, intentional news consumption might be less relevant due to people's reliance on IE. Furthermore, recent theoretical models, such as the PINE model, shifted the attention towards related but less acknowledged consequences of the developments in the media environment accompanying IE. Specifically, stumbling upon non-political information while looking for political information may even distract citizens from political information goals (Nanz & Matthes, 2020). In sum, there are quite some arguments why the scholarly attention to IE is not without merit. However, future research in this area should address this question more directly. For instance, scholars could investigate the compositional effects on citizens or consider the potential impact of preceding goals on the information processing during IE. This remains a gap to fill for future research.

On the theoretical side, research needs to examine the interdependencies between the various outcomes of IE more carefully. In fact, a substantial share of

studies is concerned with only one single outcome (e.g., Heiss & Matthes, 2019; Oeldorf-Hirsch, 2018; Marcinkowski & Došenović, 2021), and the relationships between the outcomes are typically ignored. However, most likely, the various outcomes of IE are intertwined. Related to that, we need a better theorizing about the underlying mechanisms leading to the various outcomes of IE. Considering cognitive and affective mechanisms more closely may advance the field. Cognitive mechanisms, for example, may include increases in topical interest due to IE, leading to subsequent engagement with IE content. Affective mechanisms may include the elicitation of anger (leading to mobilization), or anxiety (leading to additional information search). Thus, we need more complex theoretical approaches targeting the underlying psychological mechanisms. Along those lines, the PINE model suggests that the effects of IE may depend on the effort of processing: Second-level IE, involving the effortful processing of IE content appraised as relevant, may lead to stronger democratically relevant outcomes than first-level IE, which refers to the mere scanning of IE content.

We found that effects of IE are strongest when there is congruence between the exposure setting and the outcome setting. In short, IE has the strongest effect when the outcome happens at the same platform or in the same situation in which IE happens. One explanation is that effects of IE are rather immediate, potentially short-lived. Future research should therefore pay more attention to the temporal order of effects. That is, IE on social media may primarily affect, for instance, intentional news consumption on social media. This news consumption on social media may not lead to strong learning effects itself. It may, however, spark interest, leading to offline media use, which then fosters deeper learning. Two theoretical implications follow: First, we need additional theorizing on the longevity of effects. If IE happens, potential effects may quickly disappear when there are no situation-congruent opportunities for democratically relevant outcomes. Second and related, research on IE needs to establish a diachronic perspective (Matthes & Schemer, 2012), that is, a process perspective rather than an outcome-oriented perspective. This means that outcomes of IE need to be understood in their temporal order. Estimating effects on various outcomes simultaneously, as evident in most studies, may fall short. This perspective calls for news designs, especially experiments, which are able to observe real processes rather than counting mere effects.

This insight might also be applicable to other subfields of communication research in which IE plays a role (e.g., health communication, advertising). The impact of IE to health information could be shaped by the congruency between the media type on which IE occurred and the opportunities provided during the reception situation. In case these findings translate into the context of health communication, health campaigns should approach individuals wherever they stumble upon health information. For example, articles and posts about diseases and health risks should be accompanied by related opportunities to schedule medical checkups, vaccination appointments or other preventive measures.

On the methodological side, there is quite some variation in experimental designs. In fact, some experiments on IE (e.g., Bode, 2016; Feezell & Ortiz, 2021) could be criticized for not fully ensuring that individuals possess a processing goal unrelated to the IE content. We included experiments for which it was reasonable to assume that respondents did not intentionally turn to the IE content. However, future research should rely on more rigorous experimental designs. This is particularly important given the mere participation in an experiment can have unintended consequences (e.g., respondents may turn to political stimuli more often due to demand effects). We recommend that experiments directly manipulate the processing goal, making sure that participants pursue a task unrelated to the IE content.

Furthermore, existing survey measures have substantial room for improvement. We detected two aspects future research has to attend to. First, there are no validated scales to measure IE. As noted above, based on previous definitional and theoretical work, we decided to include only surveys that mentioned the incidental nature of the exposure explicitly in the survey items. Thereby, some widely cited papers were not included. This decision rule has been criticized by reviewers as being strict. We believe that this rule is reasonable given that we can thereby at least ensure some level of face validity for survey measures. In our perspective, this means that survey measures must signal the incidental nature of exposure to respondents explicitly. However, other measures that do not explicitly mention IE may still touch on the phenomenon (e.g., Barnidge & Xenos, 2021). But they may also not. Therefore, future research should aim to develop and validate scales to assess IE. Given that self-report exposure measures have been criticized, future validation efforts for IE measures should also involve non-survey data (e.g., trace data, eye-tracking, see e.g., Vraga et al., 2019).

Second, most existing survey measures do not distinguish the passive scanning of incidentally encountered information from the elaboration of IE content appraised as relevant (Matthes et al., 2020). Hardly any study has considered information processing occurring during IE (but see e.g., Oeldorf-Hirsch, 2018). It can be argued that the distinction between effortful processing and the brief scanning of IE content may explain variance across outcomes of IE. Additionally, given that there is already some heterogeneity in question wording, future research should explicitly discuss their choice of question wording and reflect more carefully on the decisions during operationalization. As another methodological implication, our findings on media types clearly suggest that studies should not create IE scales by averaging items that assess levels of IE on different media types.

Conclusion

Using a meta-analytical approach, this study aimed at quantifying the effect of IE on five key political outcomes. Our findings suggest that IE to political information has, in fact, democratically relevant consequences. However, when it comes to experiments and panel studies, the relationships are small and nuanced, qualifying the

hope that IE can strongly inform and reengage citizens detached from politics. We also show that the effects of IE are strongest when there is congruence between the exposure setting and the outcome setting. With these findings, this meta-analysis opens up completely new theoretical and methodological avenues for IE research and beyond. Future research should particularly focus on the congruency between the exposure setting and the outcome setting. Additionally, improved survey measures and elaborate experimental designs are needed.

Supplementary material

Supplementary material is available online at *Journal of Communication*.

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Conflict of interest

On behalf of all authors, the corresponding author states that there is no conflict of interest.

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Notes

1. The search string was ("news" OR "politic*" OR "media") AND ("incidenta* expos*" OR "incidental news expos*" OR "incidental news" OR "stumbling upon" OR "accidental* expos*" OR "inadverten* expos*"). Because ScienceDirect did not allow wildcard operators (*), the search string was slightly adapted for this database.
2. In this step, we only excluded non-social science research as well as social science research concerned with non-political topics like advertising or health. All studies concerned with political outcomes remained in the dataset and were reviewed more closely.
3. Some studies matched more than one exclusion criteria (e.g., content analysis in advertising research).
4. More specifically, the usage of specific media channels (e.g., Facebook) measured in general terms (e.g., hours per day) or for various purposes (e.g., social interaction motivation for social media use) does not tell us anything about IE. In this step, we also excluded experimental research for similar reasons. Importantly, for the inclusion decision, we cannot take into account whether a paper's narrative builds upon or mentions IE. Only the design and operationalization is relevant for this decision. Thus, some studies that

(heavily) discuss IE or related concepts but do not operationalize IE were excluded from this meta-analysis.

5. Measures of the level of attention dedicated to political information or news are not sufficient to qualify as IE measures. Clearly, even intentional exposure can be accompanied by very low levels of attention. Items must have explicitly mentioned that exposure lacked intention. Additionally, studies using (digital) trace or logging data which were sometimes accompanied by surveys were excluded because the operationalization does not allow any assumptions about the user's intention during exposure. Multiple studies matched more than one exclusion criteria.
6. First, experimental designs that provided participants with a task unrelated to the IE content clearly manipulate IE given that they make sure that participants have a processing goal unrelated to the IE content during exposure. Similarly, quasi-experimental research assessing the processing goal retrospectively falls into this category. Second, we also included experiments that exposed respondents to stimuli with at least 50% non-political content (e.g., Bode, 2016). Such experiments made sure that respondents were exposed to a substantial amount of non-political content they could attend to during stimulus exposure, making it more likely that exposure to the IE content was indeed incidentally. Third, field experiments that manipulated the amount of political information in the participant's newsfeeds (e.g., asking respondents to follow an account that posts political information) were included because we can reasonably assume that individuals did not have the goal to see the content they encountered due to the experimental manipulation (e.g., Feezell & Ortiz, 2021). While we strongly believe that the first variant of experiments should be considered as the gold standard of experimental research on IE due to the fact that it is the only variant that offers experimental control of (a) the amount of exposure and (b) the processing goal during exposure, the other two types of experimental design may also be able to shed light on some aspects of the phenomenon of IE, and thus were included in this meta-analysis. We excluded experiments lacking a proper control group (e.g., Nanz & Matthes, 2020). In case of experimental research, we included measures of participation intentions and discussion intentions.
7. In a few instances, multiple records used the same sample but each record added variables of interest that were not mentioned in any of the other records. We only kept the first record coded as eligible. However, we list all the other papers that helped us to identify additional outcomes of interest for each study in Online Appendix C.
8. It is not uncommon that only a small share of initial search results is eligible for inclusion in a meta-analysis. For example, searches in large databases spanning across multiple disciplines can produce a share of unrelated work (e.g., toxicology research about *incidental exposure* to chemical mixtures). The PRISMA figure in Online Appendix A shows the amount of records excluded at each stage of the eligibility-coding procedure.
9. In case of experimental research, we also included measures for intention. This also applies to the dependent variable political discussion.
10. In many cases, studies reported more than one effect size per dependent variable (e.g., multiple participation measures). Two (or more) effect sizes calculated from the same participants might be more alike (i.e., correlated) than effect sizes from different studies. Given that we do not have the covariances between outcomes for every study, we were not able to compute a covariance matrix for the outcomes. We turned to multi-level modeling.
11. We modeled sampling variance at the first level, within-study variance at the second level, within-publication variance at the third level, and between-publication variance at the fourth level. We added random effects for effect sizes (i.e., not assuming homogeneity within studies), studies, and publications. The publication-level cluster variable was

coded based on the record through which we found the study (see Online Appendix C). Additionally, all Pew studies were coded as one cluster. Hypothesis tests for the overall effect size analyses were fully replicated with meta-analysis models using aggregated effect sizes per study as proposed by Lipsey and Wilson (2001). The magnitude of effect sizes differed for some of the outcomes from the estimates reported in Table 1 due to different weighting.

12. We calculate the *Q* statistic to conduct a test for heterogeneity. A significant test suggests heterogeneity which is statistically improbable to be created by random error. The I^2 statistic signals the proportion of observed variance in effect sizes caused by the respective cluster level in the multi-level analysis. We used log-likelihood-ratio tests to determine whether the variance component of level 2, 3, and 4 were significant.
13. Moderator categories represented by less than three studies were excluded from the analyses. We compared the estimate for each level of the moderator against zero and tested levels of the moderator against each other.
14. A formal moderator analysis comparing *sr* and *r* in one model is available in Online Appendix F. However, due to reasons outlined in the appendix (e.g., substantial differences in variance between *r* and *sr*), results of the moderator analysis should be interpreted with caution.
15. The file-drawer analysis is based on recommendations by Rosenthal (1979). The reported fail-safe *N* is the number of additional null-findings it would need to render the overall effects analysis insignificant.
16. A lack of studies with small samples that report small effect sizes can be an indicator for publication bias (Lipsey & Wilson, 2001). Studies with small samples (i.e., larger standard error) and small effect sizes should appear in the lower left corner of the funnel. If this portion of the funnel seems to have fewer data points compared to the other parts, this is an indicator for publication bias. Additionally, we report results from an Egger's regression test which is a test for funnel plot asymmetry (Egger et al., 1997). Significant results can be an indicator for publication bias if the visual inspection of the funnel plot led to a similar conclusion.
17. We thank an anonymous reviewer for coining this wording.

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