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A three-level random-effects meta-analysis

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[Link to publication]

Citation for published version (APA):

Article

How Satirical News Impacts Affective Responses, Learning, and Persuasion: A Three-Level Random-Effects Meta-Analysis

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Abstract

Satirical news blends entertainment with information and opinion. Satire can thus impact various audience responses, such as positive and negative affect, learning, and persuasion. However, the presence and size of these communicative effects have been debated. We conducted a three-level random-effects meta-analysis on the impact of satirical news ($k = 70$, $N_{total} = 22,969$). We compared satirical news to two reference categories: (1) control messages with no or irrelevant information, and (2) regular news with similar informational content. Results demonstrate that satirical (vs. regular) news increased positive affective responses and message discounting. By contrast, satire increased learning compared to control messages, but not compared to regular news. We find limited evidence for a positive main effect of satire on persuasion. However, we find different moderating effects, indicating that persuasion effects are stronger for Republicans (vs. other voters), student (vs. general-population) samples, TV satire (vs. online and print satire), and for satire targeting social actors.

Keywords

satirical news, late-night comedy, meta-analysis, political humor, news effects, journalism, political communication

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In the last decades, new communication genres have emerged that can be seen as a blend of several classical genres, a phenomenon known as "discursive integration" (Baym, 2005; Brugman et al., 2020). Satirical news is a good example of such a hybrid genre with discursive integration (Baym, 2005), as it typically blends (a) entertainment, (b) information, and (c) opinionative elements (Brugman et al., 2020). Traditionally, these three communicative goals were each explored in their own communicative genre: humor in entertainment genres like sitcoms, political reporting in hard news, and political persuasion in opinionated news. However, in satirical news, a genre has emerged that can potentially achieve these three disparate goals at the same time.

For all three core functions of satirical news (entertainment, informing, opinion), opposing hypotheses can be found in the literature. First, for entertainment, previous studies have shown that satirical news can both increase entertainment, by tapping into humor (e.g., Edgerly & Vraga, 2019; Skalicky & Crossley, 2019) and decrease entertainment, by causing offence (e.g., Becker, 2018; Daskal, 2015). For information, satirists have been described as "cultural authorities" on political issues (Tenenboim-Weinblatt, 2009) while their genre of satirical news has simultaneously been classified as a type of fake news (Tandoc et al., 2018). For opinion, satirists have been described as "opinion leaders" in public debates on political issues (Crittenden et al., 2011), while often only speaking to a particular (partisan) part of the electorate (Young et al., 2019).

One explanation for these diverging perspectives may stem from satire having been studied from two distinct perspectives: one that sees satire reaching out to audiences who do not tune in to regular news, and one that sees satire as an alternative to regular news consumption. As we argue below, these two perspectives have not always been explicitly distinguished in experimental research, which may be an important reason for such diverse perspectives. To bring this research together, we conducted a meta-analysis to study if and when satirical news impacts three potential central audience outcomes: (1) affective responses, which may be driven by satire's entertainment function, (2) learning, which may be driven by satire's reporting function, and (3) persuasion, which may be derived from satire's opinionative function.

Different Perspectives on Satire

Satire is a multifaceted phenomenon, which can be expressed through many media and modalities including TV series (e.g., Netflix's *Space Force*), film (e.g., Jason Reitman's *Thank You For Smoking*), literature (e.g., George Orwell's *Animal Farm*), video games (e.g., *Grand Theft Auto*), and visual art (e.g., Marcel Duchamp's *L.H.O.O.Q*). Due to this multifaceted nature, satire has been difficult to capture in one conceptual definition (Condren, 2012; Knobloch-Westerwick & Lavis, 2017). Instead, most scholars focus on conceptual elements that distinguish satire from non-satire.

Satirical news is a relatively new type of satire that has become popular across the globe (Baym & Jones, 2013), and is often contrasted with "regular" news. Satirical news typically offers humorously intended updates about and criticisms of specific

societal actors, issues, and/or events (Skalicky & Crossley, 2019; Tandoc et al., 2018; Young et al., 2019).

Satirical news can manifest in different media, like television (e.g., *The Daily Show with Trevor Noah*; *Full Frontal with Samantha Bee*), print (e.g., satirical items from *De Speld* published in the Dutch newspaper *De Volkskrant*), and online media (e.g., websites like *The Onion* and *The Babylon Bee*). Satirical news can refer to either an entire outlet or a specific segment within a larger (non-satirical) outlet. For instance, in the case of TV satire, some programs completely consist of news satire (e.g., *Last Week Tonight with John Oliver*), but, in other cases, satirical news can be restricted to a specific segment within a larger program (e.g., satirical monologues in late-night comedy shows like *Late Night with Seth Meyers* and *The Late Show with Stephen Colbert*, or *Cold Open* and *Weekend Update* sketches in *Saturday Night Live*). Even *The Daily Show*, which has been described as the seminal example of satirical news (Baym, 2005; Feldman, 2017), often contains celebrity interviews which are mostly of a non-satirical nature (Baym, 2007).

Satirical News as Entertainment

When asked about their roles in public discourse, many satirists argue that they primarily see themselves as comedians and entertainers. For instance, during an interview on FOX News, Jon Stewart declared that "I am a comedian first" (Hughes, 2011). Similarly, when asked about the journalistic impact of his work, John Oliver stated: "I am not a journalist at all, obviously! I am a comedian" (Brachmann, 2016). In this perspective, satirists thus see generating positive affective responses (e.g., humor, enjoyment) in audience members as a key element of their work.

Providing entertainment is also a core motivation for audience members to tune in to satirical news. One study for instance found that 80% of satirical-news viewers list humor and entertainment as the main reason for preferring these programs (Young, 2013). Similarly, a recent study focused on how audience members perceive the "news-ness" of a story attributed to different news sources (Edgerly & Vraga, 2019, Study 2). In this study, "news-ness" was defined as a continuum ranging from whether a story's goal was mainly to provide entertainment (low news-ness) to news (high news-ness). The study revealed that a story attributed to a satirical-news source was perceived as having lower news-ness than a study attributed to an elite news source like the *New York Times*, or an opinionative news source like *Mother Jones* (liberal) or the *Drudge Report* (conservative). These studies demonstrate that, like satirists themselves, audience members see humorous entertainment and providing enjoyment as core elements of satirical news. We thus propose:

> *H1. People experience more positive affective responses after exposure to satirical (vs. regular) news.*

However, affective responses to satirical news are not necessarily positive. A key element of satirical news is critiquing the functioning of politics, world affairs, and the

news media (Becker, 2018; Brewer & Marquardt, 2007; Holbert, 2013), indicating that satire typically exposes flaws and injustices in politics and media. Because of this critique, satirical news can activate negative emotions in viewers (Feldman, 2017). For instance, one study found that exposure to satirical news may lead to feelings of anger (Chen et al., 2017). Empirical research has also connected exposure to satirical news with systemic cynicism (Guggenheim et al., 2011). In this way, satire can motivate negative affective responses, like anger arousal or fear arousal.

A second connection between satirical news and negative affect lies in the target of the satire. Many satirical pieces attack a specific individual, group, or norm. If audience members feel that a specific joke or comment crossed the line, the satire may cause offence (Becker, 2018; Daskal, 2015). For instance, Daskal (2015) describes how aggrieved audience members have filed complaints to regulators about satire that they felt crossed an acceptable boundary. Similarly, across the globe, political elites have expressed complaints and filed lawsuits against satirists who targeted them. Examples include US President Trump, who disparaged satirists on Twitter (Becker, 2018) and Turkish President Erdogan, who filed a lawsuit against German satirist Jan Böhmermann (Graefer & Das, 2020). We thus propose:

H2. People experience more negative affective responses after exposure to satirical (vs. regular) news.

Audience responses may also be related to the processing of satirical messages.[1] One important processing variable is message discounting. Research proposes that satire may lead to more message discounting than regular news due to its humorous format. This means that satire can be seen as less serious than regular news and quicker dismissed as "just a joke" (Nabi et al., 2007). Message discounting implies a reduced motivation to critically engage with the message content because it is perceived as less worthy of critical scrutiny (LaMarre et al., 2014). Message discounting may be particularly strong when the satire is geared more toward jocular humor (LaMarre et al., 2014), which may suggest to audience members that the piece is meant in jest and can be seen as mainly humorous. Thus, we expect that:

H3. People engage in more message discounting after exposure to satirical (vs. regular) news.

Satirical News as Information Source

An important issue in effects research on satirical news that has not often been made explicit relates to the audience of satirical news. The perspective on this issue has consequences for the experimental design, particularly in the choice of the comparison category against which a potential effect of satirical news can be established (see also O'Keefe, 2017). Some scholars argue that soft-news formats like satirical news may appeal to news consumers who are less attentive to more traditional ("hard") forms of news ("regular news"; e.g., Baum, 2003). Under this perspective, learning and

persuasion effects can be established by comparing satirical news to a control condition without news information because the audience of satirical news would otherwise not consume news content in another format. By contrast, other scholars propose that many news consumers are exposed to both satirical and regular forms of news (Hmielowski et al., 2011; Young & Tisinger, 2006). In this perspective, effects can be established by comparing satirical news to regular news content with similar factual information. In the current study, we take both reference categories into consideration to provide a full picture of learning and persuasion effects of satirical news.[2]

Next to entertainment, a second potential communicative effect of satirical news is informing the audience about societal issues (Baek & Wojcieszak, 2009; Becker & Bode, 2018). This potential effect can be connected to the question whether satirists can be classified as journalists or not (Borden & Tew, 2007; Tenenboim-Weinblatt, 2009). Some scholars propose that satirists should be seen as a new type of journalist (Baym, 2005; Tenenboim-Weinblatt, 2009). For instance, content analyses have demonstrated that satirical news broadcasts tend to contain equal amounts of substantive information as traditional news broadcasts (Fox et al., 2007) and focus largely on politics and policy debates (Brewer & Marquardt, 2007). Similarly, a qualitative interview study with satire producers from Sweden and Finland has shown that satirists embrace some traditional journalistic values like political relevance and striving for factuality (Koivukoski & Ödmark, 2020). Such studies thus suggest that satirical news contains factual news information to a level comparable with regular news.

Since satirical news on average contains a relatively large amount of factual information (Fox et al., 2007), some have described satirical news as an "experiment in journalism" (Baym, 2005). Furthermore, audience members of political satire indicate that they tune in to learn about current events and to get a contextualization of the news (Young, 2013). Thus, we expect that, compared to a control message without information on the topic of the satire, satirical news can stimulate learning in its audience (Baum, 2003), leading to:

> *H4. People have more knowledge about a societal topic after exposure to satirical news, compared to a control message.*

Even though satirical news contains an amount of substantive information comparable to regular news (Fox et al., 2007), learning effects of regular news may still outperform those of satirical news. A first reason for this explanation is that some scholars propose that satirists should mainly be described as imitators of journalists rather than as actual journalists (Borden & Tew, 2007), which means that satirists cannot be held to *all* journalistic norms. In addition, satire can be characterized as a form of discursive integration (Baym, 2005; Brugman et al., 2020), blending entertainment, news, and political opinion. Discursive integration in satire is reflected through fictive interaction blends, in which satirists typically mix fact and fiction in order to make a specific rhetorical point (Fonseca et al., 2020). Fictive interaction in satirical news can for instance be achieved through the use of a satirical persona. Examples include Stephen Colbert and Jordan Klepper who satirized conservative pundits in *The Colbert*

Report and *The Opposition*, respectively. Other examples of satirical personas include the use of faux correspondents (e.g., *The Daily Show*, *The Late Show with Stephen Colbert*). Such satirical personas contain fiction because they do not represent the satirist's actual beliefs and opinions, and contain fact because they comment on actual news events.

Online satirical news outlets like *The Onion* (US), *The Beaverton* (Canada), or *The Daily Mash* (UK) also contain fictive blends of current events. By combining actual news events with one or more fictional elements, the satirical words in such outlets should not be taken at face value. Instead, the audience is asked to infer the satirist's actual, intended meaning (Baumgartner & Morris, 2008). As a result, satirical news is sometimes classified as a sub-type of fake news because the literal meaning of the words used is not the factual meaning the satirist aims to convey (Brodie, 2018; Tandoc et al., 2018). A core difference with the more mainstream use of the term "fake news" is that satirists do not aim to deceive their audience, but provide cues to help the audience pick up on the satire (Egelhofer & Lecheler, 2019).

Even though satirists provide cues to alert audience members to the satire, in some cases, audience members do not pick up on these cues and take satire at face value (Bowyer et al., 2017; LaMarre et al., 2009). In these situations, misinterpretation of the satire may lead to the audience being less informed. By contrast, traditional news is typically straightforward in the message it wants to convey, and could be easier to understand than satire. Thus, we expect that:

> *H5. People have less knowledge about a societal topic after exposure to satirical news, compared to regular news.*

Satirical News as Persuasion

Next to potentially entertaining and informing the audience, satire has the possibility to sway its audience's opinions on societal actors and/or issues. A key element of satirical news is critiquing the functioning of politics, world affairs, and the news media (Brewer & Marquardt, 2007; Holbert, 2013). This critical position implies that a satirist takes a certain stance toward the issue under discussion. In this context, a persuasion effect occurs if a reader adjusts their own attitude or behavior in the direction implied by the satirical news item.

Scholars generally agree that satirical news can shape the attitudes of its audience in becoming more consistent with the satirical message (Holbert, 2013; Waisanen, 2018), but differ on how large satire's influence is. Some scholars have proposed that satirical news can be a powerful tool toward impacting audience behavior because it can light a spark in its audience that can have wide-ranging societal consequences (Waisanen, 2018). For instance, Popović (2018) argues that the use of humor allowed the *Otpor!* ("Resistance") grassroots movement to grow in Serbia in the 1990s, eventually leading to the downfall of the Milošević regime. Similarly, satirists are often described as opinion leaders on specific topics (Crittenden et al., 2011) because they

can place specific issues on the political or public agendas (Boukes, 2019). This would suggest a large influence of satire on persuasion.

An explanation for such a persuasion effect may be found in a study by Kim and Vishak (2008), who discuss online-based versus memory-based processing of satirical and regular news. The online-based model of information processing proposes that individuals mainly use the information they encounter during processing to form an evaluative judgment of the satirical target, and keep an "online tally" of evaluative judgments about a particular satirical target based on the information presented in the message. By contrast, the memory-based model of information processing suggests that an evaluation is mainly formed based on political information that an individual already has available in long-term memory, indicating potentially less influence of the message than in case of online-based processing (Kim & Vishak, 2008, pp. 341–342). Kim and Vishak (2008) demonstrate that satire generally motivates online-based processing of political information, while regular news stimulates memory-based processing of political information. This implies that any political information presented may sway audiences of satirical news more than consumers of regular news.

By contrast, other approaches would predict that persuasive effects of satirical news are statistically modest to small (Day, 2013; Holbert, 2013). One of the reasons may lie in the partisan nature of satirical news (Young et al., 2019). Several studies have found a selective-exposure effect, suggesting that audience members more often consume satirical media that are congruent (vs. incongruent) with their own political positions (Knobloch-Westerwick & Lavis, 2017; Stroud & Muddiman, 2013). This may imply that persuasion effects are smaller because audience members already have a firm prior opinion on the topics being discussed. This finding is further supported by a recent meta-analysis on effects of humor in a variety of contexts (Walter et al., 2018), which demonstrated that humor has a weak but significant effect on persuasion.

Nevertheless, most literature expects that satirical news can persuade the audience to adapt a stance in line with the satirical message ("message-consistent effects"; Day, 2013; Holbert, 2013), even though expectations differ on the magnitude of this effect. Thus, we expect that:

> H6. Satirical news has a message-consistent effect on persuasion, compared to both (a) a control message and (b) regular news.

Potential Moderators

Studies on the impact of satirical news can differ on a variety of aspects. Next to dependent variables (e.g., affective responses, learning, persuasion) and comparison conditions (e.g., control, regular news), studies on satirical news also differ in (a) characteristics of the sample under consideration and (b) characteristics of the experimental stimuli. A key advantage of meta-analysis is that it enables us to also compare effects based on characteristics of the sample and experimental stimuli.

Relevant sample characteristics include: (a) political orientation, (b) country in which the study was conducted, (c) age, and (d) gender. A first sample characteristic

that could be a potential moderator is participants' political orientation. Political orientation may impact if and how viewers see a news item (Coe et al., 2008; LaMarre et al., 2009), with viewers preferring news content that aligns with their own political position. This is particularly relevant for satirical news in a US context, given that many US examples of satirical news have been created from a liberal perspective (Young, 2019; Young et al., 2019), although some conservative US satirical outlets can be found (Brugman et al., 2020). The partisan nature of satirical news can contribute to political polarization in various ways (Feldman, 2017). First, US-based research demonstrated that liberals are likelier to select and consume satirical news content than conservatives (Hmielowski et al., 2011; Knobloch-Westerwick et al., 2017). Second, satire viewers may engage in biased processing, which result in interpretations that align with their own perspectives. An example can be found in the study of LaMarre et al. (2009), who focused on biased processing of *The Colbert Report*, in which host Stephen Colbert gave a satirical imitation of a right-wing conservative host. Their study demonstrated that conservative viewers more often took Colbert's words at face value, while liberals more often interpreted them as satire. Such different interpretations of the same information could increase the distance between these groups. This implies that political orientation may moderate effects of satire, and that effects may be stronger among audiences who hold a political position similar to that of the satirist.

A second sampling characteristic could be the country in which the experiment has been conducted. Satirical news has become a popular genre across the globe (Baym & Jones, 2013), in countries with different political systems and humor traditions. Thus, while US satirical news may be performed from a clearly liberal (and in some exceptions: conservative) perspective, the political position of satirical news in other countries may be more ambiguous. A good example of the latter case was the Dutch satirical news show *Zondag met Lubach*, in which host Arjen Lubach advocated both relatively left-wing and relatively right-wing policy positions. In such countries, satire may have different effects on its audience.

Third, scholars have observed that, compared to regular news, the audience of satirical news is typically younger (Feldman, 2007; Hmielowski et al., 2011; Young & Tisinger, 2006). This could imply that the format of satire appeals more to a younger (vs. older) audience, and that effects of satire may thus be particularly pronounced for younger (vs. older) audiences. Fourth, gender may impact audience responses to satirical news. Different studies have demonstrated that men and women evaluate humor differently (Chan, 2016; Yoon & Lee, 2019). For instance, Schwarz et al. (2015) show that men generally have a more positive evaluation of satirical humor than women. This raises the question whether audience effects of satire are also larger among younger (vs. older) participants and among men (vs. women). This leads to the question:

> *RQ1. Are effects of satirical news on learning and persuasion moderated by (a) political orientation, (b) country, (c) age, and (d) gender?*

Different characteristics of the experimental materials may also impact how viewers respond to satire. Relevant characteristics of the experimental materials include: (a) use of existing source materials, (b) medium, and (c) target of criticism. A first issue to consider is whether studies used experimental materials that were solely created for the purpose of the study or that were taken from existing sources (Katz, 2009). An advantage of the first option is that it allows researchers to have higher control over the included information and mode of presentation. An advantage of the second option is a higher ecological validity.

Next, we study whether the medium in which the satire has been presented (TV, online, or print) impacts its reception. Previous studies have demonstrated that communication medium can impact participant responses. For instance, consumers of both print (Clinton, 2019; Neijens & Voorveld, 2018) and TV (Dijkstra et al., 2005) have been shown to have higher learning effects than consumers of equivalent online content.

Finally, a potential moderator could be the target of the satire (Hoffman & Young, 2011). In some cases, satire may be issue-focused, which means that a satirist may explain a complex issue comprehensively (Becker & Bode, 2018). Examples of this type of satire include longer segments in satirical shows like *Last Week Tonight* (Becker & Bode, 2018) and *Zondag met Lubach* (Boukes, 2019) on issues like net neutrality or international trade agreements. In other cases, satire may be person-focused, offering criticism of a specific public figure (Bresnahan et al., 2017). Examples of this type of satire include political sketches in *Saturday Night Live* that feature caricatured impersonations of specific political and other social actors (Becker, 2021; Gilbert, 2019). A third type of satirical target is regular news media, and the way they report on issues (Brewer & Marquardt, 2007). An example is the segment "Real News Tonight" in Stephen Colbert's *Late Show* that satirized the way in which some US conservative outlets reported on President Trump (Withers, 2018). News consumers may respond differently to these three types of satirical critique. We thus ask the question:

> *RQ2. Are effects of satirical news on learning and persuasion moderated by (a) type of experimental materials, (b) communication medium, and (c) satirical target?*

Method

Inclusion Criteria

In order to be included in the meta-analysis, a study had to meet several criteria. First, it needed to have an experimental design with random assignment of participants to experimental conditions.

Second, at least one experimental condition needed to contain exposure to satirical news. Satirical news included outlets in which news and actualities were covered with satiric or parodic commentary, such as in late-night political comedy shows like *The*

Daily Show or *Last Week Tonight*, or outlets that featured satiric impersonations such as *Saturday Night Live* and *The Onion*. Furthermore, the satirical-news condition needed to include political humor presented by a comedian, meaning that cases of politicians using humor (e.g., in a campaign speech or interview) were excluded. Finally, the satirical-news condition needed to include exposure to satirical news only. For instance, Holbert et al. (2007) studied primacy effects of satirical news, by presenting all participants with both a satirical and a regular news program (with alternating presentation order as the independent variable). Because such experiments combined presentation of satirical news with other media content, they were excluded from this meta-analysis.

Third, the experiment needed to include a reference category, which could either be a non-satirical news item about the same political topic, a message unrelated to the topic of the satirical news item, or a no-message condition. The controls of "unrelated control message" and "no message" were collapsed into the "control" comparison group, as these participants did not receive any information about the political topic under investigation. Experiments that only included variations of the same satirical news message without a non-satirical comparison group (e.g., LaMarre et al., 2009; Young et al., 2019) were excluded. Exceptions were experiments with multiple waves with a pre-exposure measurement. For instance, Peifer (2018) conducted a two-wave experiment on the effect of satirical news on trust, containing only satirical-news stimuli. As data for wave 1 were collected prior to exposure and data for wave 2 were collected after exposure to the satirical news, data from wave 1 were treated as a no-message condition.

Fourth, participants had to be adults and native speakers of the language in which the study was conducted. Finally, the dependent variable needed to include some measure of affective response, message discounting, learning, and/or persuasion.

Literature Search

To identify relevant studies, a systematic review for publication title, abstract, and keywords was conducted in multiple electronic databases in Spring of 2018.[3] The database search allowed for casting a wide net, and for identifying potentially relevant studies from a wide variety of disciplines (e.g., communication science, political science, linguistics, psychology). The search string used wildcards, and included both words for satire and related terms (e.g., parody, comedy, irony, humor), and words to limit the domain to politics and/or news.[4] Study selection was done through the online application *Covidence* (https://www.covidence.org/). In the first step, references were imported into Covidence, which automatically removed duplicates. In the second step, we screened abstracts for potentially relevant studies. The third step comprised of reading the method sections to evaluate each paper in relevance to the inclusion criteria. Finally, studies were coded for the relevant variables (see the flowchart in Supplemental Appendix A).

An important question for any meta-analysis is whether to only include peer-reviewed journal articles or to also include "gray" literature such as conference

proceedings or PhD dissertations. Previous research has provided empirical support that both communication science (Vermeulen et al., 2015) and the social sciences in general (Franco et al., 2014) may suffer from publication bias. This means that studies with non-significant findings are underreported in the literature. As a result, a meta-analysis containing only journal articles may overestimate the substantive population effect. To remedy this potential problem of publication bias, meta-analysis experts recommend to make an active effort to include gray literature in a meta-analysis (Polanin et al., 2016), and to run statistical diagnostics to check for publication bias (Sun & Pan, 2020). For that reason, the current meta-analysis contains both journal articles and gray literature[5] and reports on publication-bias checks.

If a study was published in multiple outlets (e.g., a dissertation chapter or a conference paper that was later published as a journal article or a book chapter), we included only the peer-reviewed version (journal article or book chapter) to prevent the same study from being included twice. In cases in which multiple publications report on the same study/sample but present analyses of different variables, both studies were included. We used a three-level meta-analytic model to prevent these studies from being counted twice (see the section on "Analysis strategy" for more details). In other cases, one publication could contain multiple experiments. In such cases, each experiment was counted as a separate study. Some studies collected data from different countries (e.g., O'Connor, 2017). In those cases, data from each individual country were treated as separate studies.

We calculated Cohen's d as a measure of effect size based on the information provided in the paper. In cases in which a publication did not include sufficient information to calculate a Cohen's d coefficient, we contacted the corresponding author for more information. In case a corresponding author did not respond and a publication had multiple co-authors, we also contacted these co-authors. Unfortunately, 10 publications were dropped at this stage because authors did not respond to our email requests or no longer had access to the data. One further publication was dropped because several effect sizes calculated from the information in the paper were exceptionally large outliers (e.g., in one case, Cohen's $d > 17$), and the authors no longer had access to the primary data. For three publications, only partial data were available. In those cases, we included the available data in our analysis.

Information Retrieved From Studies

Each study included in the meta-analysis was coded for a number of variables. First, we coded for study variables like year of publication and time of data collection, and for sample variables such as country in which the study was conducted, gender distribution, average age, level of conservatism, and political affiliations. Scholars have observed that the audience of satirical news is relatively young (Hmielowski et al., 2011; Young & Tisinger, 2006) which is why many studies on satirical news used university students as the population of interest. For this variable, we coded whether a sample was drawn from mainly college students or from the wider population.

With regards to study characteristics, we coded the independent variable of exposure to satirical news on a number of dimensions. First, we coded whether the non-satiric comparison group comprised either a "no message"-condition, or a regular news item about the same topic. We coded various aspects of the satirical news items used, such as its country of origin, medium (TV, newspaper, online), and whether the satire was issue-driven (mostly aimed at political issues), person-driven (mostly aimed at social or political actors), or news-media-driven (mostly aimed at regular news media). These latter three variables were all coded as binary variables because it was possible for a particular stimulus to focus on two or more of these categories.[6]

We coded for five dependent variables: positive affective responses, negative affective responses, message discounting, learning, and persuasion. Positive affective responses referred to affective and emotional responses that are typically seen as positive, like enjoyment or perceived humor. Negative affective responses included negative emotional responses like fear arousal or anger arousal. Message discounting concerned the degree to which audience members actively counter-argued or dismissed the message. Learning referred to elements of participants' factual knowledge, which, theoretically, could be empirically falsified as being true or false, and included dependent variables like factual recall, issue knowledge, and risk perceptions. By contrast, persuasion referred to participants' attitudes, intentions, and behaviors. Attitudes refer to participants' evaluative perceptions, and included dependent variables related to both evaluations of individual social and political actors, evaluations of specific issues (e.g., support for specific policies), and evaluations of political institutions (e.g., political trust). Intentions could also refer to specific individual political actors (e.g., voting intention) or general political behavior (e.g., intention for political participation). Behaviors referred to participants' actions after exposure to their experimental condition, such as online search behavior about the news issue. We coded the persuasion variable in such a way that a higher score on persuasion indicated that the position of the participant was more in line with the position taken in the satire. For instance, if a satirical piece was critical toward a specific politician, a more negative attitude toward that politician was coded as being in line with the position of the satirical news item.

All relevant variables in all studies were coded independently by the two authors of this paper. Krippendorff's alphas for all variables were .85 or higher, which is above the critical threshold of .80 (Krippendorff, 2013, p. 325; see Table 1 for details). Disagreements were resolved after discussion.

Effect Size Calculation and Analysis Strategy

Many studies in our sample contained multiple relevant outcome measures (e.g., multiple persuasion variables). Furthermore, in some cases, relevant measures drawing from the same sample were spread over multiple publications (e.g., when a dissertation chapter contained additional dependent variables that were not reported in the journal publication). In traditional meta-analyses, scholars in such cases either focus on only one of the dependent variables, ignore the dependencies or aggregate the multiple

Table 1. Coding Categories and Reliability Scores Per Coded Variable.

Type of reference category		Description	α	%
Control message		No or irrelevant information on satire topic	.97	98.57
Regular news		Regular news with similar informational content as satire		

Type of dependent variable		Description	α	%
Learning		Knowledge obtained	.90	93.07
Persuasion		Change in attitude, intentions, or behavior		
Positive affective responses		Change in positive affective responses (e.g., perceived humor, enjoyment, happiness)		
Negative affective responses		Change in negative affective responses (e.g., anger, worry, fear)		
Message discounting		Message reactance and message discounting		

Type of moderator	Coding categories	Description	α	%
Study characteristics	Publication year	Year in which each study was published	1.00	100
	Publication type	Journal, or other (book, doctoral dissertation or conference paper)	1.00	100
Sample characteristics	Percentage of Democrats	Percentage of Democrats in each study (note: only coded for US studies)	.999	95.57
	Percentage of Republicans	Percentage of Republicans in each study (note: only coded for US studies)	.998	92.22
	Percentage of Independents	Percentage of Independents in each study (note: only coded for US studies)	.95	78.89
	Conservatism	Rating on conservatism, with higher scores being more conservative	.98	92.22
	Sample	Student or population-based sample	.93	96.67
	Participant age	Average age of participants in each study	.998	96.67
	Participant gender	Percentage of female participants in each study	.95	93.33
	Country	Country in which each study was conducted	1.00	100
Satire characteristics	Type of materials	Stimuli taken from real-life examples or created for the study specifically	.82	96.67
	Medium	Medium of the satire (TV, Online, or Print)	.90	94.44
	Issue-focused satire	Satire primarily focused on political or social issues (or not)	.81	92.22
	Person-focused satire	Satire primarily focused on political or social actors (or not)	.86	93.33
	Medium-focused satire	Satire primarily focused on regular news media (or not)	.88	98.89

Note. α = Krippendorff's alpha; % = percent agreement.

variables into a single index. In this paper, we present a three-level random-effects meta-analyses because this type of meta-analysis can better deal with such dependencies and is thus preferred over traditional approaches (Moeyaert et al., 2017; Van den Noortgate & Onghena, 2003).

A three-level meta-analysis is a multilevel approach that distinguishes sampling variance of individual effect sizes (Level 1), variance between the different effect sizes

included in the same study (Level 2), and the variance between different studies (Level 3). Three-level meta-analysis thus allows for the inclusion of multiple dependent variables per study, and for the inclusion of dependent variables from the same sample spread over multiple publications. A simulation study by Moeyaert et al. (2017) demonstrated that this type of meta-analysis results in unbiased estimates of fixed effects and related standard errors and variances. Another advantage of three-level meta-analysis is that, in contrast to the multivariate approach to meta-analysis, it does not require that sampling covariance of effect size estimates is known in advance because sampling covariance is accounted for on the between-study level (Moeyaert et al., 2017). In addition, this type of meta-analysis can relatively easily be extended with moderators at different levels of analysis (Moeyaert et al., 2017).

We ran our analyses using the metafor package, version 2.1-0 (Viechtbauer, 2010) for R, version 3.5.2 (R Core Team, 2018), following the procedure for three-level random effects meta-analyses as described by Assink and Wibbelink (2016). We conducted two separate log likelihood tests to assess heterogeneity at the within-study and between-study levels. Significance of these tests indicates heterogeneity which can be explored by adding potential moderators. All data and procedures are available on the Open Science Framework (OSF) page of this project at https://osf.io/qst34/.

Results

Main Effects, Tests for Publication Bias, and Tests for Heterogeneity

In total, the meta-analysis contained 70 unique studies (N_{total}=22,969) from 72 publications: 57 journal articles, 5 book chapters, 5 conference papers, and 5 doctoral dissertations. In total, four publications contained more than one relevant experiment, and data from six samples was spread over more than one publication. While satirical news has become popular across the globe (Baym & Jones, 2013), 62 out of 70 studies (88.6%) in our meta-analysis were conducted in the United States (See Supplemental Appendix B for an overview of included studies).

We ran several main analyses, comparing the effects of satirical news on positive and negative affective responses, message discounting, learning, and persuasion. We expected that, compared to regular news, satire had a positive effect on positive affect (*H1*), negative affect (*H2*), and message discounting (*H3*). *H1* was supported (mean d = 0.902, p < .001; see Figure 1). According to Cohen's (1992) indices, this is a large effect. By contrast, *H2* was not supported (mean d = 0.321, p = .107). With regard to *H3*, we found support for a medium effect (mean d = 0.617, p = .041; see Figure 1). In sum, these analyses demonstrated that, compared to regular news, satire increased positive affective responses and message discounting, but not negative affect.

H4 predicted that satire has a positive effect on learning compared to a control message. This hypothesis was supported by the data (mean d = 0.504, p < .001). According to Cohen's (1992) indices, this is a medium effect. *H5* posited that audiences have more knowledge about a topic after exposure to regular (vs. satirical) news. This hypothesis was not supported by our data (mean d = −0.107, p = .456). *H6* stated that
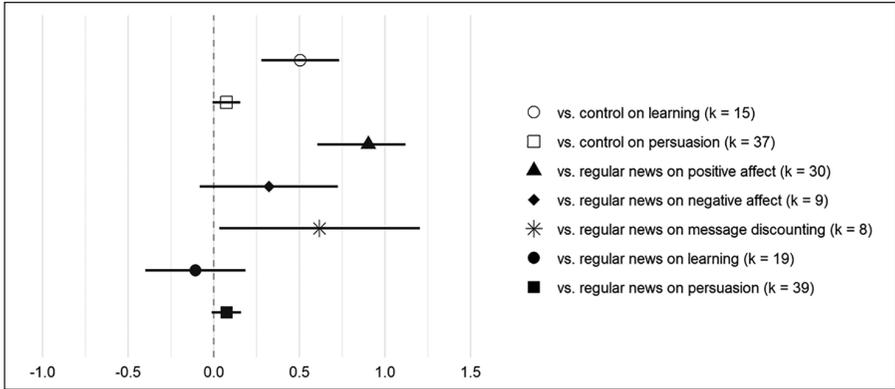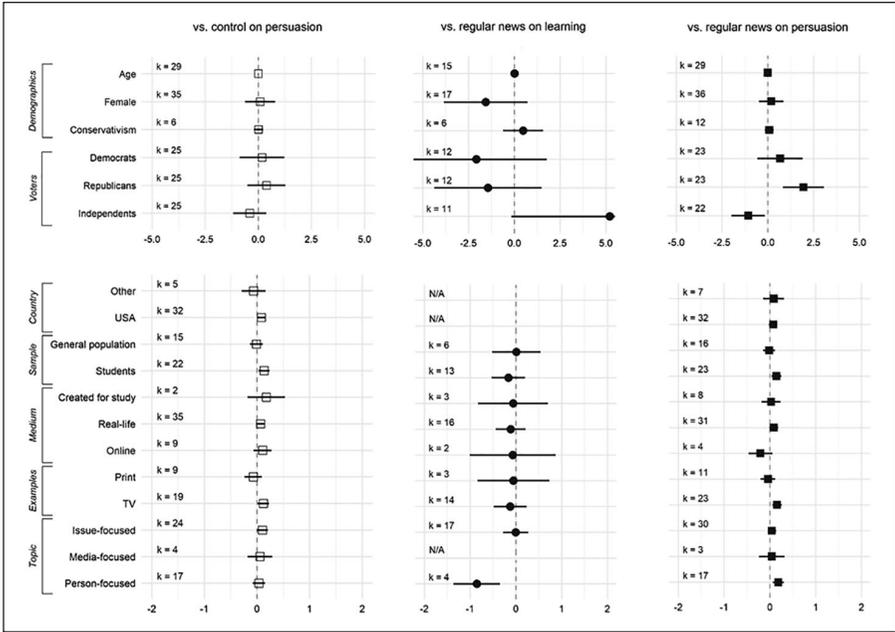
Figure 1. Weighted Cohen's *d* of satirical news effects with 95% confidence intervals.

satirical news would have a message-consistent effect on persuasion. Our data provided some support for this hypothesis, revealing a trend of satirical news on persuasion compared to both a control message (mean $d = 0.073$, $p = .078$) and regular news (mean $d = 0.074$, $p = .088$).

Next, we tested for publication bias in a number of ways. First, we checked whether publication year or type of publication (journal vs. other) moderated the main effects. These checks were all non-significant (see Figure C1 in Supplemental Appendix C).[7] Second, we ran Egger et al.'s (1997) test to check for asymmetry of the funnel plot (see Supplemental Appendix D for the funnel plots).[8] The omnibus test was non-significant for all but one of the main analyses (Satire vs. control: learning, $F[1, 18] = 1.00$, $p = .331$; persuasion, $F[1, 100] = 1.313$, $p = .255$; Satire versus regular news: negative affective responses, $F[1, 10] = 0.050$, $p = .827$; counter-arguing, $F[1, 6] = 0.978$, $p = .361$; learning, $F[1, 25] = 2.657$, $p = .116$; persuasion, $F[1, 98] = 2.452$, $p = .121$). However, the omnibus test was significant for the effects of satirical (vs. regular) news on positive affective responses ($F[1, 33] = 7.372$, $p = .011$). Third, we ran Begg and Mazumdar's rank correlation test, which was non-significant in all cases (Satire vs. control: learning, Kendall's $\tau = .126$, $p = .461$; persuasion, Kendall's $\tau = .066$, $p = .330$; Satire vs. regular news: positive affective responses, Kendall's $\tau = .148$, $p = .226$; negative affective responses, Kendall's $\tau = .182$, $p = .459$; counter-arguing, Kendall's $\tau = -.214$, $p = .484$; learning, Kendall's $\tau = .177$, $p = .196$; persuasion, Kendall's $\tau = .038$, $p = .578$). These results overall indicated that publication bias was mostly absent from this meta-analysis.

As a third step, we conducted log likelihood tests to assess within-study and between-study heterogeneity. To assess the percentage of variance at each level (results are reported in Supplemental Appendix E), we used Assink and Wibbelink's (2016) R script of Cheung's (2014) formula. We found significant between-study heterogeneity for effects of satire (vs. control message) on persuasion and for effects of satire (vs. regular news) on learning as well as on persuasion. We thus conducted moderator analyses on these three cases with significant between-study heterogeneity.

Figure 2. Weighted Cohen's *d* of satirical news effects with 95% confidence intervals for each moderator.
Note. N/A = Moderation cannot be calculated due to lack of variance in the moderator variable.

Moderator Analyses

We considered two types of moderators: (1) sample characteristics and (2) characteristics of the experimental materials. Figure 2 presents a visual summary of results, and the tables in Supplemental Appendix E give exact details for all analyses.

Sample characteristics. RQ1 considered whether political orientation, age, gender, and the country in which the study was conducted served as moderators of satirical news effects. Comparing satire to regular news, we found moderating effects of political orientation on both learning and persuasion. The percentage of Independent voters moderated the effect of satirical (vs. regular) news on learning, in that learning effects were higher in samples with more Independents. By contrast, we found that effects of satirical (vs. regular) news on persuasion were smaller for samples with more Independents. In addition, persuasion effects of satirical (vs. regular) news were more in line with the position taken in the satire in samples with more Republicans.

With regards to age, we found moderating effects of sample type on the effect of satire on persuasion. When satire was compared to either a control or to regular news, the effect of satire on persuasion was higher in student samples compared to samples drawn from the general population. However, mean age in years was not a moderator

in any of these analyses. Finally, we found no moderating effects of gender and country.

Characteristics of the satire. RQ2 explored whether the type of experimental materials, the communication medium, the type of show, and the satirical target were moderators of satirical news effects. First, we found no moderating effects of the type of experimental materials. However, we did find that the communication medium moderated persuasion effects of satire. Specifically, compared to regular news, TV satire had larger effects on persuasion than online or print satire.

We also found that, when comparing satire to regular news, the target of the satire impacted both learning and persuasion. Issue-focused satire had a larger effect on learning than other types of satire. By contrast, person-focused satire had a detrimental effect on learning, in that learning effects were higher for both regular news and for other satire types. However, person-focused satire did have a larger effect on persuasion, compared to both regular news and other satire types.

Conclusion and Discussion

Satirical news has three main communicative goals: entertainment, information, and opinion (Baym, 2005; Brugman et al., 2020). The goal of the current paper was mapping when and how satire achieved these communicative goals. For the entertainment goal (*H1–3*), we found that, compared to regular news, satire positively affects positive affective responses and message discounting, but not negative affective responses. For the information goal (*H4–5*), we found that satire had a positive effect on learning compared to a control message, but had no learning effect compared to regular news. Finally, for the opinionative goal (*H6*), we found that satirical news has a very small but message-consistent effect on persuasion, compared to both a control message and regular news.

These results have important implications for satire research. First, we found that some effects were relatively consistent across audiences and satire types, in that we found no significant between-study heterogeneity. This was the case for all entertainment effects of our meta-analysis, and for the effect of satire on learning compared to a control message. In addition, effect sizes for entertainment and for learning were relatively large compared to effect sizes found in other meta-analyses on media effects. Weber and Popova (2012, p. 198) provide an overview of effect sizes in communication research. Following their findings, our effect size for learning (satirical news vs. control message) falls in between the 50% and 75% percentile for (1) media-effects research and (2) instructional effects in communication. This indicates that at least 50% of effect sizes in media-effects research and in instructional communication is below our learning effect. In a previous meta-analysis on effects of humor, Walter et al. (2018, p. 356) also report a learning effect (Cohen's $d = 0.473$)[9] that is very similar to the effect of satirical news (vs. control) on learning we found in our study (Cohen's $d = 0.504$).

The effect sizes for message discounting and positive affect are in between the 75% and 90% percentiles (Weber & Popova, 2012, p. 198), suggesting that these effects are larger than at least 75% of effect sizes in media-effects research. Please note that negative affective responses and message discounting were included in a limited number of studies and that the confidence intervals of these effects are relatively large, so we also recommend more research into these outcome variables.

These entertainment effects have particular consequences for the learning function of satire. Our results demonstrate that participants have positive affective responses to satirical news, and entertainment may be an important reason for audiences to tune in to satirical news (Edgerly & Vraga, 2019). Thus, in situations in which audience members do not attend to regular news, they may tune in to satirical news. In such cases, satirical news could serve as an alternative information source (Baum, 2003; Becker & Waisanen, 2013). However, research has also demonstrated that this group may be relatively small as most audience members of satirical news also consume regular news (Hmielowski et al., 2011; Young & Tisinger, 2006). Nevertheless, for this (small) group of audience members who do not consume regular news, satire may be a worthwhile information source.

How satire can foster learning for this (small) group of audience members who consume little to no regular news can be explained through the political incidental news exposure (PINE) model (Matthes et al., 2020). The PINE model focuses on audience members who only incidentally encounter political news on social media like Twitter or YouTube. This may be the case for these satire consumers, given that they do not (frequently) consume regular news. According to the PINE model, such incidental exposure to political news is processed on two levels. In the first level, audience members check the content briefly for relevance. If the content is deemed relevant, the audience member moves on to the second level in which the message is processed more intensively. The PINE model subsequently proposes that learning effects are mostly found when audience members engage in more intensive (second-level) processing (Matthes et al., 2020). Given that our meta-analysis showed that satire evokes much more positive affect than regular news, it may be the case that, for incidental exposure, news consumers move to the second level relatively more often for satirical news. By contrast, audience members who also frequently consume regular news may have already engaged in effortful processing of regular news, indicating that satire does not offer an additional knowledge gain for this group. Future research could strive to explicitly test these relations between satire processing and learning based on the PINE model.

For persuasion, we found a trend indicating that satire has a small message-consistent effect. These main effects are not only statistically small following the guidelines of Cohen (1992), but are also on the smaller side for persuasion effects, falling in-between the 10%–25% percentile of all effect sizes for studies on persuasion effects in communication science (Weber & Popova, 2012, p. 198). This implies that at least 75% of persuasion studies find a stronger effect than the persuasion effect for satirical news. A previous meta-analysis on persuasion effects in humor (Walter et al., 2018, p. 355) found a much larger main effect of humor on persuasion (Cohen's $d = 0.262$) than

the effects we found in our study (Cohen's *d* scores of 0.073 and 0.074 respectively). This indicates that satirical news may be less persuasive than other forms of humor.

Various scholars have observed that many news consumers are exposed to both satirical and regular forms of news (Hmielowski et al., 2011; Young & Tisinger, 2006). Overall, we find that, while entertainment effects for this group are relatively large, learning and persuasion effects for this group are relatively small. This effect can be interpreted in two distinct ways. On the one hand, for a large part of its audience, watching satire after consuming regular news about the same news event has little additional impact on learning and persuasion. After all, when a particular news event is both covered in regular and in satirical news, the satirical news does not impact audience perceptions in different ways from the regular news. From this perspective, satire would be particularly pronounced when it reports on issues that are not covered by regular media and places these issues on the political, public, and/or media agendas (Boukes, 2019). On the other hand, these results demonstrate that satire should be taken seriously as an alternative news source. After all, regular news sources do not outperform satire in informing the public on important issues.

It should also be noted that effect of satirical news differ between studies. In some cases, learning and persuasion effects of satire may be stronger than in other cases. After all, for effects of satirical (vs. regular) news on learning and of satirical news (vs. both control messages and regular news) on persuasion, we found significant between-study heterogeneity. This perspective is in line with the differential susceptibility to media effects model (DSMM; Valkenburg & Peter, 2013), which also proposes that media effects may differ between (groups of) audience members.

Subsequent analyses demonstrated that various moderators may explain differential effects of satirical news. First, we found that a number of audience characteristics moderated effects of satirical news. Political orientation moderated effects on both learning and persuasion (*RQ1a*). Learning effects of satire were highest for the group of voters that is most likely to be in the political middle (Independents). Yet, effects of satirical (vs. regular) news on persuasion were highest in samples with more Republicans. Given that most satirical news has a liberal bias (Young, 2019; Young et al., 2019), and that conservatives may be less likely than liberals to select and consume satirical news (Hmielowski et al., 2011; Knobloch-Westerwick et al., 2017), this finding may be surprising. However, when audience members do consume satirical news, they may have engaged in more online processing (Kim & Vishak, 2008). This means that, when processing satire, audience members use message information to form an evaluative judgment of the satirical target. By contrast, consumers of regular news engage in more memory-based processing, which implies that they form their evaluation more on information available in their long-term memory (Kim & Vishak, 2008). Given that, for conservative audiences, this memory-based position may be different from the position in the (liberal) satire, this allows for the possibility of a larger persuasion effect for this type of audience.

An important caveat for these audience-characteristics effects lies in the fact that a large majority of studies was conducted in the United States (*RQ1b*). The few studies from other areas of the world come from a wide range of countries in Europe (e.g.,

Boukes et al., 2015), Asia (e.g., Chen et al., 2017), and South America (e.g., Mendiburo-Seguel et al., 2017). US satire is highly partisan (Young, 2019), but satire in other countries may be more ambiguous (Brugman et al., 2020). Furthermore, partisanship and polarization may work differently in the United States compared to many other countries (Suiter & Fletcher, 2020). Thus, the lack of studies outside of a US context is an important lacuna in the literature. We thus recommend that more satire research is conducted outside of a US context to see whether effects that are reported so far are specific to the US context or generalize to other countries as well.

Previous studies have also observed that satirical humor appeals more to young (vs. older) people (*RQ1c*) and to men (vs. women, *RQ1d*). Our results provide only limited support for the former position (Feldman, 2007; Hmielowski et al., 2011). While age in years does not serve as a moderator, the type of sample did moderate effects on persuasion: persuasive effects of satirical news were much larger in student samples, as compared to samples drawn from the general population. Specifically, satire's persuasion effects for student samples were in between the 25% and 50% percentile of effects for persuasion studies in communication science, while satire's persuasion effects for the general population were in between the 0% and 5% percentiles (Weber & Popova, 2012). Student samples typically deviate from the general population in two ways: the average age in student samples is typically lower and education level is typically higher than in samples drawn from the general population. In other words, satirical news may only appeal to *some* young people (i.e., those in college) rather than to *all* young people. Future research could focus on this assumption by comparing effects of satirical news in college students and in young audience members not enrolled in college. Even though men and women typically prefer different types of humor (Chan, 2016; Schwarz et al., 2015; Yoon & Lee, 2019), this does not transfer to differential effects of satirical news on learning and persuasion. Future research could zoom in on these potential gender effects, through experimental research explicitly connecting enjoyment experiences to learning and persuasion outcomes.

Next to audience characteristics, we find moderating effects of characteristics of the experimental materials (*RQ2*). Here, two moderating effects stand out: (1) the role of medium and (2) the type of satirical target. For medium, we found that TV satire had larger persuasive effects than online or print satire. This finding was relatively unexpected, but we hypothesize that an explanation may be found in that most TV satire is professionally produced by a creative team, while this may not be the case for all forms of online satire.

Another moderator was the target of the satire. Results suggest that moderator effects of satire target could be divided into two groups: (1) issue-focused satire which, overall, positively affects learning and (2) person-focused satire, which, overall, has a negative effect on learning but a message-consistent effect on persuasion.[10] In other words, satirical shows that broadcast longer and more informative pieces (Becker & Bode, 2018) have different audience effects than satirical shows that mainly make fun of individual social or political actors. Future research could continue this line of enquiry by more explicitly contrasting effects of these types of satire within one study.

In sum, we conducted a meta-analysis to determine satire's entertainment, learning, and persuasion effects. We find that satire leads to more positive affective responses and message discounting than regular news. In addition, we also find a substantive learning effect of satire for audience members who do not consume regular news. By contrast, we find limited evidence for a message-consistent main effect of satirical news on persuasion. However, we find different moderating effects, indicating that persuasion effects are stronger for Republicans (vs. other voters), student samples (vs. samples drawn from the regular population), TV satire (vs. online and print satire) and for satire targeting social or political actors. Taken together, these results demonstrate that satirical news can have important and often subtle effects on audience reception.

Acknowledgments

Declaration of Conflicting Interests

Funding

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Supplemental Material

Supplemental material for this article is available online.

Notes

1. We also checked for other processing outcomes, but found too few studies to include them in this meta-analysis. For instance, attention was measured in three studies, message elaboration was measured in two studies, and source trustworthiness was measured in four studies.

2. While the control messages had in common that they did not include relevant information on the news topic at hand, the actual control messages used across experiments were quite diverse ranging from animated humorous cartoons like *Tom and Jerry* (e.g., LaMarre et al., 2014, Study 1) to music videos of popular songs like Mark Ronson and Bruno Mars' *Uptown Funk* (Becker & Bode, 2018) and television programs like *Finding Bigfoot* (Brewer & McKnight, 2015). Given this large genre variety in control messages, we did not take affective responses to these unrelated control messages into account in this meta-analysis.

3. The following databases were searched: *ComAbstracts, Communication and Mass Media Complete; Via EBSCO*: EBSCO ebooks, PsycARTICLES, Psychology and Behavioral Sciences Collection, PsycINFO; *Via ProQuest*: ABI/INFORM Global, British Humanities Index, International Bibliography of the Social Sciences; Linguistics and Language Behavior Abstracts, ProQuest Dissertations and Theses, Modern Language Association International Bibliography; *Via ISI Web of Science*: Social Sciences Citation Index, Arts and Humanities Citation Index, Emerging Sources Citation Index, SciELO Citation Index; *Directory of Open Science Journals (DOAJ); AllAcademic* (https://research.allacademic.com/).

4. The full search string was: (satire OR satir* OR irony OR ironic* OR parody OR parodies OR comedy OR sarcas* OR humor OR joke OR jokes OR "daily show" OR "weekend update" OR "saturday night live") AND (politic* OR polic* OR president* OR government* OR parliament* OR democra* OR party OR parties OR candidate* OR election* OR campaign* OR debate OR "public opinion" OR "public support" OR news* OR journalis*).

5. To search for gray literature, we included a number of research databases that typically include unpublished work, such as ProQuest Dissertations and Theses (which includes PhD dissertations) and AllAcademic (which includes conference papers).

6. A good example is the study by Young (2008) that presented participants with various satirical clips related to the 2004 US Presidential Elections that both discussed Bush and Kerry's personalities, and dealt with political issues that were relevant at the time of these elections.

7. For the persuasion variables, we also checked for differences in effect sizes between attitudes, intentions, and behaviors, for which we did not find any evidence (see Tables E3 and E8 in the Supplemental Appendices).

8. We used the version of Egger et al.'s (1997) test that was adjusted for three-level models, and included the standard errors of the effect sizes as an additional moderator.

9. Both Weber and Popova (2012) and Walter et al. (2018) report Pearson's correlation r, which we have transferred to Cohen's d values to contrast them with our own findings. For instance, Walter et al. (2018, pp. 355–356) report Pearson's correlation r of .23 for effects of humor on learning and a Pearson's correlation r of .13 for effects of humor on persuasion, which correspond to Cohen's d values of 0.473 and 0.262, respectively.

10. A third type of satire target focuses on regular news media (e.g., Brewer & Marquardt, 2007). However, relatively few experiments tested effects of this target type on learning and persuasion (see Tables E2, E3, E7, and E8 in the Supplemental Appendices).

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