Beaten by Chartbeat?

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BEATEN BY CHARTBEAT?
An Experimental Study on the Effect of Real-Time Audience Analytics on Journalists' News Judgment

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ABSTRACT

Traditionally, journalists had the autonomy to decide what is worthy enough to be considered news. However, the growing centrality of audience analytics in the news selection process warrants greater scrutiny in how these tools are likely to influence journalistic perceptions on which news stories the public is most interested in. Taking a quantitative approach, we conducted a survey-embedded experiment among political journalists in Belgium ($n = 136$). The journalists were asked to rank a set of five headlines from most to least prominent on a fictional homepage of a news outlet. Stories with positive analytics were genuinely ranked higher compared with stories in the control condition, whereas stories with negative analytics were ranked lower. Especially for soft news items, it seems that audience analytics can make a difference. However, for hard news, the effect was not significant. Furthermore, the effect of audience analytics remains limited compared with the impact of a traditional news value such as negativity. In this way, this study confirms, but also nuances, the impact of audience metrics.

Introduction

Every day, journalists and editors have to choose which events deserve their attention and which will be ignored, which will be placed upfront and which will be given a more modest spot in the news. In the pre-internet era, this whole process of news selection and news placement was clearly guided by journalists as the prime gatekeepers. Using news values and their professional gut feeling, journalists determined what the public would be interested in. However, advances in audience measurements have given journalists greater and more precise knowledge of audience preferences than before, which have made the audience a more influential player in the news selection and production process. Using specialized tools such as Chartbeat or Google Analytics, journalists and editors are now able to measure in real-time how the audience responds to and engages with news content through clicks, likes, and shares (Tandoc 2014a). As a consequence, online readers are increasingly influencing what stories are featured prominently

on the homepages of news websites (Schaudt and Carpenter 2009). The growing importance of audience metrics on news selection has raised the concern that this will lead to a news agenda dominated by "a culture of click" (Anderson 2011). This leads to the central question of this paper: *are audience metrics replacing or rather validating the role of traditional journalistic perceptions of newsworthiness?*

Although the research on the recent intrusion of audience metrics in the world of journalism is growing rapidly, several shortcomings remain. First, most studies focus on editors and webmasters that decide on the placement of (online) news stories, while devoting less attention to the effects on ordinary journalists (but see Hanusch 2017). Second, most research that studies the effect of analytics on journalistic practices is based on in-depth interviews or ethnographic research (for example, Cherubini and Nielsen 2016; Ferrer-Conill and Tandoc 2018; Tandoc 2014a; Usher 2013). Although these research provided valuable insights on how journalists deal with these new data, it does not measure to what extent they are influenced by audience metrics in their news decision process. To study the effect of metrics on news judgment, a more quantitative and direct approach is needed (see Tandoc 2014b; Vu 2013; Welbers et al. 2016). This study tries to address both lacunas by using an experimental approach to study the influence of real-time analytics on the placement of news stories by political journalists. We fielded a survey-embedded experiment among political journalists in Flanders, the Dutch-speaking part of Belgium ($n = 136$). Journalists in the experimental condition judged the newsworthiness of five fictional headlines, within which we carefully manipulated three characteristics: the type of news (hard vs. soft news), the tone of the news (positive vs. negative) and audience analytics (increasing vs. decreasing traffic). In this way, we do not only study the main effect of audience metrics but also how this information interacts with the type and tone of the news headline. Journalists in the control condition also ranked the fictional headlines but were given no additional information about audience data. This experiment allows us to consider *whether* and *to what extent* journalists are willing to subordinate their judgment of newsworthiness to audience analytics. In other words, can a tool like Chartbeat beat traditional journalistic perceptions when it comes to determining which stories deserve a prominent place in the news?

The remainder of the paper is structured as follows. The first section introduces previous research regarding gatekeeping and newsworthiness and the influence of web analytics on journalistic news selection. Next, we discuss the methodological choices undertaken and the results of the experiment. Our study confirms the impact of audience analytics but also indicates their relative limited and contingent influence. Finally, the paper ends with a discussion of these nuanced findings and suggests ways for future research.

Literature Review

Audience Gatekeeping

Journalists have long considered the task of news gathering and selection as their exclusive occupational turf (Shoemaker and Vos 2009). This gatekeeper role, first applied to the newsroom by White (1950), describes the selection process that determines which of potentially newsworthy events and information are allowed to pass through "the gates"

of the newsroom (Bruns 2005). The gatekeeping theory, in essence, places journalists and editors at the core of the news production process, arguing that the news is shaped by the news judgment of professionals. This one-way communicative structure of mass-mediated journalism has led to audience preferences being largely ignored (Coddington 2018). Although media workers have turned to audience research to give them some notion about the general interests of their readers, it did not come often enough to help them adjust their daily editorial decision-making (Shoemaker and Reese 1996). Consequently, news in the pre-internet era was generally a top-down product, with stories produced independently of news audiences (Schultz 1999). According to Gans (1979, 230), most editors held the impression that "what interested them would interest the audience" as well. Instead of seeking out specific information about the wants or tastes of the audience they addressed, journalists tended to prioritize commonly shared news values (Boczkowski and Peer 2011; Singer 2011). These professional news values contained some notion of what the public is interested in but remained rather implicit or vague about what the public actually wanted, leaving plenty of room for journalistic interpretation and autonomy MacGregor (2007). However, the unidirectional gatekeeping power of journalists has weakened in the past decades, as the rise of new, digital media technologies has made the audience much more obtrusive to journalists. Via new, "unmediated" communication channels such as websites, blogs, and social media, a broad range of ordinary people is now able to interact with news content in unprecedented ways. For example, readers can write comments that appear below a news item, repost an article's link to their social media profiles or simply "like" the news content. Besides greater interactivity and input of the audiences, digital technologies have also made it possible for news organizations to record what people choose to read or interact with online (MacGregor 2007). The aggregated outcomes of these interactions can be seen as a news item *popularity* and an assessment of a news item's value according to the audience (Shoemaker et al. 2011). Popularity cues, which, according to Haim, Kümpel, and Brosius (2018), represent "metric information about previous users' behavior or their evaluation of entities," might indicate the relevance users attribute to news stories (Porten-Chée et al. 2018). Hence, journalists' perceptions of the newsworthiness of an event nowadays interact with the readers' perceptions of relevance. This may alter the logic of news production from being driven by internal standards of newsworthiness (Galtung and Ruge 1965; Gieber 1999), to being steered more by audience feedback and preferences (Shoemaker and Vos 2009; Strömbäck and Karlsson 2011). Harcup and O'Neill (2017) even suggested that popularity cues have become a news value in their own right (see also Hermida et al. 2012; Paulussen, Harder, and Johnson 2017; Philips 2012). They argue that stories "thought likely to generate sharing and comments via Facebook, Twitter, and other forms of social media" have become a more important consideration in the journalistic news selection process (p. 13). Through either their intended (likes and shares) or unintended (clicks) patterns of news consumption, audiences, hence, can have an impact on gatekeeping practices, albeit indirectly (Strömbäck and Karlsson 2011). According to Shoemaker and Vos (2009) "the most significant impact of the audience channel is that it requires the revision of the original gatekeeping model" that gave primacy to journalists (p. 129). Shoemaker et al. (2011) proposed revision accounts for emerging practices of "audience gatekeeping" as the online audience is now able to influence subsequent decisions by journalists through their news consumption experiences.

Web Metrics

With technological developments like Chartbeat or Google Analytics, journalists can now instantly and more accurately assess the popularity of particular stories online. Forced to cope with declining print circulation and contiguous advertising revenues, increased exposure to audience feedback appears to encourage journalists to become more consumer-oriented and produce news that people want to know while journalism's role has traditionally been understood as providing the people with the news that they need to know (Hanusch and Tandoc 2017; Tandoc and Thomas 2014). Tandoc and Vos (2016) spoke of "marketing the news" as journalists now seem to produce news aimed at the widest possible audience, allowing audience analytics and thus, market logic to influence news production, rather than their journalistic judgment. This initial skepticism among scholars and practitioners about the impact of audience metrics on journalism seems to have shifted toward a more nuanced and sometimes, even optimistic view (see for example Cherubini and Nielsen 2016). The effects of audience metrics appear to be more limited than originally anticipated, with recent scholarship observing mixed attitudes, behaviors, and impacts on content (Petre 2015; Zamith 2016). According to Zamith (2018), these nuances have led to new discourses that emphasize how audience metrics can be used as complementary tools to journalistic values. Hindman (2017) for example, argued that "journalists now have a positive obligation to use these new audience measurement tools" in order for them to understand what audiences want and how they interact with content.

The growing acceptance of audience metrics may thus, lead toward journalists slowly normalizing the technology into their existing routines and practices of news production (Lasorsa, Lewis, and Holton 2011; Nelson and Tandoc 2018). However, we know relatively little about how much impact these systems are having on the journalistic behavior of individual reporters and the content they produce, as the majority of studies focused on senior editorial ranks (Hanusch 2017; Zamith 2018). Especially, editors tasked with the daily management of the homepage and treatment of stories seem to have embraced web analytics in their news work, which has resulted in increased power for audiences in the gatekeeping process. A number of studies have focused on the short-term impacts of increasing and decreasing traffic on story placement on the homepage. Lee, Lewis, and Powers (2012) found that audience clicks affect subsequent story placement on the homepage of a news organization and that the effect of these clicks on story placement is stronger than the inverse. Bright and Nicholls (2014) showed that most-read articles were less often removed from the homepage and that this effect was broadly similar for both soft and hard news and surprisingly greater for "quality" publications than for their "popular" counterparts. Tandoc (2014a) spoke in this regard of "de-selection," a new gatekeeping practice, which implies that news media decide to take stories out on the website to replace them by a new story based on audience metrics instead of relevance. Based on the growing importance and acceptance of audience metrics in the newsroom, we also expect that journalists' judgment of the "newsworthiness" of news stories is increasingly being influenced by the analytics that show and predict the "noteworthiness" of these stories (Lee and Chyi 2014). This leads to our first hypothesis:

> H1: Journalists evaluate headlines with positive analytics as more newsworthy than headlines with negative analytics.

Judgments about newsworthiness and normative assumptions about the quality of journalistic content often go along with the broad classification of news in terms of "hard news" and "soft news." In general, soft news is considered as more entertaining or personally useful, and hard news as being socially relevant and useful to understand public affairs (Reinemann et al. 2011). The distinction between hard and soft news is also closely related to the concept of newsworthiness. The news values associated with "hard news" tend to be more dominant and less open to contestation in comparison with those of "soft news" items (Schultz 2007, 196). Therefore, hard news is implicitly regarded as carrying more newsworthiness. However, particularly in the online context, there seems to be a divergence, as the most popular stories are usually not what journalists consider to be the most important (Boczkowski, Mitchelstein, and Walter 2010). While journalists tend to prioritize public affairs or hard news stories, what online audiences click upon more often consists of soft news stories. A story attracting lots of clicks might imply some form of public endorsement by the reader (Thorson 2008). Even if these clicks do not perfectly correspond with what kinds of news content people really value, they might influence what stories journalists think the public is interested in (Welbers et al. 2016). Some authors argue that the emergence of real-time audience analytics might, therefore, lead to a "softening of news," whereby popular and often softer content is favored over hard news (Bright 2016; Schaudt and Carpenter 2009). Nelson and Tandoc (2018) for example, found evidence that editors won't decide which hard news topics to cover based on audience metrics, while they acknowledge doing exactly that when it came to soft news. That leads to our second hypothesis:

> H2: The effect of analytics on the placement of a news headline is larger for soft news than for hard news.

Even though "good news," as well as "bad news," are both considered newsworthy (Harcup and O'Neill 2001, 2017), journalists still appear to be particularly keen on negative news stories. A large body of empirical research has found evidence for the predominance of negativity in mass media reporting (Gieber 1955; Lengauer, Esser, and Berganza 2011). Some scholars have tied the media's negativity bias to journalistic professionalism and the watchdog role of the media (Leung and Lee 2014). Negative developments are more likely to become news because the media are expected to draw public attention to problems and situations that need solutions, while there is less need to highlight positive and routine occurrences (Shoemaker 2006). Although Shoemaker (1996) suggested that people are "hardwired" to consume negative news, positive news tends to attract clicks as well. Yet, the question remains whether increasing popularity of a positive news item can challenge journalists' internalized preference for negativity. Since market considerations could drive the news media to produce more positive news stories, we expect that audience metrics stimulate journalists to correct their preference for negative news:

> H3: The effect of analytics on the placement of a news headline is larger for positive news than for negative news.

While most research on web analytics has drawn conclusions about newsrooms and media organizations in general, we incorporated journalists on an individual level to scrutinize whether these tools have altered individual selection routines and individual conceptions of newsworthiness. Since there is a strong tradition of socialization in the newsroom, we

expect that the overall differences between journalists will be limited. For instance, an experimental study of the effect of political messages on political journalists indicated that the perceived importance of news values (in political messages) was hardly affected by journalistic characteristics (Helfer and Van Aelst 2015). However, in the case of audience analytics, a fairly recent innovation, we might expect that journalistic experience plays a role. While we assume that senior journalists have a more fine-tuned sense of news judgment than newer journalists (Schultz 2007), we expect them to be more hesitant toward embedding quantified knowledge of the audience into their conceptions of newsworthiness, which leads to our fourth hypothesis:

> H4: The effect of analytics on the placement of a news headline becomes weaker the more experience journalists have.

Research design

In order to disentangle if and to what extent audience analytics influence journalists' judgment, we conducted a survey-embedded experiment. Since most studies on the effects of audience analytics consist of case-studies and in-depth interviews, Lee, Lewis, and Powers (2012) argued that the challenge for future research is "to move beyond self-reports of journalistic perception and behavior, and instead use quantitative methods that reveal a more precise rendering of the relationship between audience behaviors and editorial decisions" (p. 521). Hence, an experiment has great potential to discern the causal mechanisms behind the algorithmic selection of news.

Participants

The experiment is part of a larger survey that was conducted online, and targeted political journalists working for national news outlets in Flanders, the Dutch-speaking part of Belgium, containing 60% of the population. To identify these journalists, we consulted a list that was provided by the Flemish Association of Journalists and supplemented with contact details found on the news outlets' websites throughout the years. The list contains journalists from all types of news outlets, including all the newspapers, the two main television broadcasters, and several news magazines. We defined political journalists broadly and included all journalists that are in contact with political actors at least occasionally. Data collection took place between June and September 2018. Journalists were first contacted via an invitation e-mail that contained a link to the Qualtrics survey. If journalists did not yet participate after the initial round of invitations, we used personalized reminder e-mails and phone calls. In total, 300 journalists were contacted by the research team: 148 journalists completed the survey (49%), 23 journalists accessed the survey but did not finish it (8%), and four journalists refused to take part (1%). The remaining journalists could not be reached or were, in some cases, no longer active as a journalist (42%). Of the 148 journalists that finished the entire survey, 92% (*n* = 136) eventually completed the experimental part.

   The majority of the journalists that participated in the experiment were male (79%); female journalists comprised 21%. The average political journalist in our sample is 43 years of age (standard deviation [SD] = 11.65) and has 18 years of experience in journalism

(SD = 10.34). The journalists that participated worked as regular reporters and were diverse in terms of the media they work for, with 32% working for the public broadcaster, 8% for the commercial broadcaster, 14% for popular newspapers, 24% for quality newspapers, 6% working for the Belgian press agency, 8% for regional media, 3% for alternative media, and 5% for other media. Since we aim to assess the influence of metrics on story placement, we also measured the journalists' exposure to audience data. We specifically asked journalists how often their superiors confronted them with audience data and whether they proactively checked audience data. About three out of four of the journalists in our sample (74%) have at least occasionally access to audience data. We will focus on the role of journalistic experience and use gender, age, and self-reported personal exposure to audience data as control variables.

Procedure

In the experiment, journalists were presented with the following hypothetical situation:

> Suppose you are appointed as responsible for the website of your medium. When you start your shift in the afternoon, the five news items below are on the homepage. (The user data (via Chartbeat) show that certain stories are clicked upon more than others.) How would you compose the homepage yourself? Make a ranking of the titles where [1] becomes the most prominent article on the site and [5] the least prominent. Click and drag the titles from the left to the box on the right, and put them in the correct order for their prominence.

As our main goal is to consider whether audience analytics influence journalistic judgment, we manipulated one part of our hypothetical scenario (cf. the underlined part). Participants in the experimental treatment received information about increasing or declining popularity of the headlines via a replica of the homepage plug-in of Chartbeat, which is one of the most commonly used audience analytical tools in Belgian newsrooms (see Lamot and Paulussen 2019). Participants in the control condition were given no additional information about audience analytics.

Below the introductory text, five headlines were presented to the journalists in randomized order. For one of these headlines, we carefully manipulated three characteristics: (1) the type of news (hard vs. soft news), (2) the tone of the news (positive vs. negative), and (3) audience analytics (increasing vs. decreasing vs. control condition), as we expect these independent variables to influence story placement. This experiment thus consists of a 2 × 2 × 3 between-subjects design. The manipulated hard news headline dealt with unemployment (young people finding a job easily or not) and the manipulated soft news item was about a popular TV show (announcing a new season of it or not) and were either confronted with increasing or declining Chartbeat figures. Participants in the experimental treatment were then randomly assigned to one of these eight conditions. Since measuring the prominence of a news item in the news media can be seen as a reliable and valid proxy of a news item's newsworthiness (Shoemaker 2006), we took the ranking of the manipulated headline to be our dependent variable. With the exception of the manipulated headline, we persistently kept the independent variables for the four remaining headlines constant. For reasons of comparability and to ensure that our manipulated headline was viewed as equally newsworthy as the four constant headlines, half of the continuous headlines were positive news items and half of them were negative

news items; three out of four were hard news items, and one of them was a soft news item; each of these constant headlines was accompanied by constant analytical data (increasing, decreasing, or stagnating). A complete overview of all headlines and stimuli can be found in the Appendix.

Results

To test our hypotheses and research question, an Analysis of Variance (ANOVA) was conducted. The central independent variable (Chartbeat) aggregates the effect of analytics across all experimental conditions. Next, two dummy variables were constructed for the type of news (soft vs. hard) and tone of news (positive vs. negative). By looking at the interaction between analytics and the two other independent variables, type and tone of news, we can assess whether they yield significant differences in journalists' perceived newsworthiness of the headline. The main results of the experiment are shown in Table 1.

Our first hypothesis suggests that journalists would evaluate headlines with positive analytics as more newsworthy; whereas, they would rank headlines with negative analytics as less newsworthy. In order to find support for H1, the mean ranking for the headline should yield significant differences between the treatment condition and the control condition. Journalists generally ranked stories with positive analytics ($M = 3.00$, SD = 1.53) higher than stories in the control condition where they had no information about audience analytics ($M = 2.67$, SD = 1.41). We also found that journalists ranked stories with negative analytics lower than stories in the control condition ($M = 2.46$, SD = 1.46). Since the differences between the experimental group and the control group are significant, ($F(2) = 4.25$, $p < .05$, $\eta^2 = .063$), the first hypothesis is accepted.

Secondly, corresponding to our theoretical expectations, there is a significant and strong main effect of the type of news, ($F(1) = 62.45$, $p < .001$, $\eta^2 = .33$). Not surprisingly, hard news stories are considered as more newsworthy than the soft news story. However, of principal interest to our study is the interaction between analytics and the type of news. It stood out that analytics have a stronger influence on the ranking of soft news items than on the ranking of hard news items. Soft news items with positive analytics are ranked considerably higher on the website ($M = 2.52$, SD = 1.55) compared with the control condition ($M = 1.64$, SD = 0.63), while soft news items with negative analytics are ranked considerably lower ($M = 1.38$, SD = 0.71). At the same time, there is barely any impact of analytics on the ranking of hard news items. This is reflected in Figure 1. The line for hard news is flattening, while the graph is substantially steeper for soft news. As the interaction effect between analytics and type of news is significant ($F(2) = 3.12$, $p < .05$, $\eta^2 = .047$), our data thus provide support for our second hypothesis (H2) that audience analytics have a greater effect on the story placement of soft news headlines compared with hard news headlines.

Third, the tone of news again proved significant in the expected direction: journalists consider negative news headlines as more newsworthy than positive headlines. However, we did not find the expected interaction effect between analytics and tone. As visualized Figure 2 in which we plotted the interaction effect, negative news is genuinely ranked higher than positive news (main effect), but the graph representing negative news is reasonably steeper compared with the graph representing positive news. Negative news headlines with positive analytics are ranked considerably higher ($M = 3.48$, SD = 1.50)

Table 1. Analysis of variance with story placement as a dependent variable.

Variable	Model I					Model II					Model III				
	Sum of Squares	df	Mean Square	F	η^2	Sum of Squares	df	Mean Square	F	η^2	Sum of Squares	df	Mean Square	F	η^2
Chartbeat	12.905	2	6.452	4.751*	.064	11.912	2	5.956	4.253*	.063	15.701	2	7.851	5.36**	.087
Type (negative)	13.796	1	13.796	9.518**	.068	12.703	1	12.703	9.071***	.067	15.205	1	15.205	10.903**	.085
Type (hard news)	89.960	1	89.960	62.061***	.321	87.456	1	87.456	62.455***	.330	74.567	1	74.567	53.471***	.312
Chartbeat*tone						3.000	2	1.500	1.071	.017	2.772	2	1.386	0.994	.017
Charbeat*type						8.730	2	4.365	3.117*	.047	8.530	2	4.175	2.994#	.048
Chartbeat*experience											3.53	3	1.177	0.844	.021
Chartbeat*exposure											2.053	3	0.684	0.491	.012

Note: $n = 136$.
***$p < 0.001$; **$p < 0.01$; *$p < 0.05$; #$p < .10$.
Adjusted R Squared Model I = 0.346.
Adjusted R Squared Model II = 0.369.
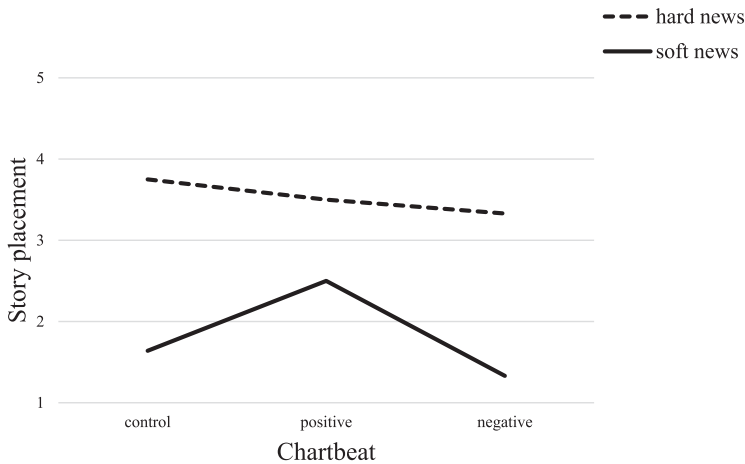Adjusted R squared Model III = 0.36.

Figure 1. Interaction effect of Chartbeat analytics and type of news on story placement (1 = least prominent; 5 = most prominent).
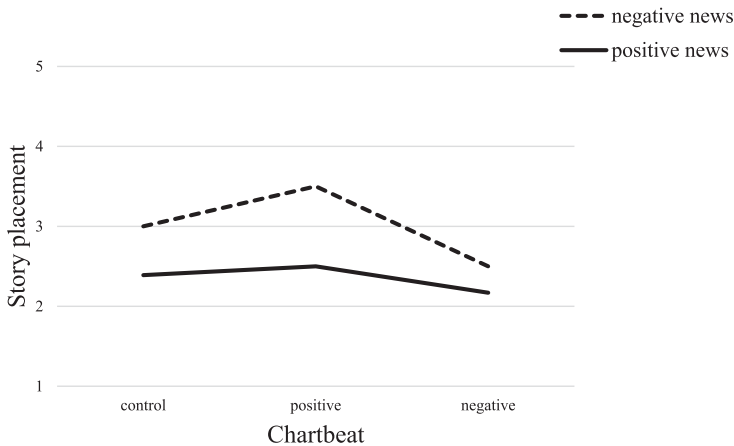

Figure 2. Interaction effect of Chartbeat analytics and tone of news on story placement (1 = least prominent; 5 = most prominent).

than items in the control condition ($M = 3.0$, SD = 1.30), while negative items with negative analytics are ranked considerably lower ($M = 2.50$, SD = 1.50). The effect on positive news items is less pronounced. Positive news headlines with positive analytics ($M = 2.46$, SD = 1.39) are ranked higher than the control condition ($M = 2.31$, SD = 1.49), while positive news headlines with negative analytics are ranked lower ($M = 2.42$, SD = 1.33). It thus seems that in contrast with our expectations, analytics have a greater effect on the story placement of negative news headlines instead of positive news headlines, although this interaction is not significant ($F(2) = 1.07$, $p = .346$, $\eta^2 = .017$). Our third hypothesis (H3) should, therefore, be rejected.

We also constructed two sub-sampled ANOVAs, splitting the sample into hard news (unemployment) and soft news (TV show) group to look at the influence of negativity in closer detail. The effect of negativity is significant for the soft news headline, while it is

borderline significant for the hard news headline ($p = .065$). So the negative variant for both types of news is ranked significantly higher than the positive variant. Yet, similar to the full model, we did not find any interaction effects between audience metrics and negativity in our sub-sampled models.

In addition, we looked at the individual level and the journalistic experience, in particular, which might have a potential influence on journalists' judgments. However, journalists do not differ among each other when it comes to determining news prominence. They ranked the headlines all in the same way regardless of their journalistic experience (H4). Also, the interaction effect with metric information proved non-significant ($p = .473$). This finding is in line with previous studies and seems to suggest that socialization among journalists is quite strong. In addition, we controlled the individual journalists' exposure to analytics since digital editors are sometimes the sole proprietors of these data in the newsroom. As the interaction effect with metric information yielded no significant results, it seems that even journalists that do not routinely access analytics themselves are not insusceptible to the influence of audience metrics. Finally, we also controlled the differences for age and gender, but these also turned out to be non-significant (not in the table).

Discussion and conclusion

This study presented the results of a survey-embedded experiment among political journalists in Belgium, designed to examine the effect of audience analytics on news judgment and story placement. Nowadays, newsrooms are extensively relying on audience analytics in their daily news work. Journalism scholars, however, have warned against the use of audience analytics for ends that are purely commercial (Hanusch and Tandoc 2017; Nguyen 2013; Tandoc and Thomas 2014). These authors argued that when journalists are merely starting to follow the dictates of the traffic, it would inevitably lead to a dumbing down of the news. This study scrutinizes the role of audience analytics in the news production process and how this technology can shape an item's "newsworthiness" in the eyes of journalists.

Our results confirm the expectation that audience analytics affect journalists' placement of news headlines. News headlines accompanied by audience analytical data generated a substantially different position compared with news headlines where journalists had no access to analytical information. Journalists ranked stories with increasing traffic signals higher, whereas they ranked stories with decreasing traffic signals lower. Audience analytics seem to influence the norm of what constitutes newsworthiness. News content today requires not only to be *newsworthy* from the journalists' perspective but also needs to be deemed *noteworthy* by the news reader (Lee and Chyi 2014). Since we studied journalists at an individual level, the results suggest that the pervasiveness of analytics goes beyond the (online) news editors that normally decide on the prominence of news stories. The effect works across the board, as we find no differences between journalists with varying levels of journalistic experience.

At the same time, however, our results strongly nuance the effect of real-time audience data. First, because the two other variables incorporated in our study, news type and news tone, proved to be more important in explaining news prominence than analytical data (see effect sizes in Table 1). Put differently, the fact that a news story is negative or deals with

hard news makes it more newsworthy than news that simply receives numerous feedbacks from the public. Second, it seems that audience data mainly work in the case of soft news and much less for hard news headlines. This implies that journalists are mainly inclined to use this information in terms of entertaining or personal stories but that it applies less for the bulk of their work on societal and political stories. As has been argued in the literature, the value of hard news is considered more self-evident and undisputed, while the newsworthiness of soft news is often debatable and disagreed upon (Schultz 2007; Shoemaker 2006). While it seems that journalists are following their own "nose for news" covering hard news topics regardless of their observed audience reception, they are willing to let analytics tell them otherwise for soft news items (see also Nelson and Tandoc 2018). A possible explanation could be that audience analytics offer intrinsic information about the audience against which journalists can compare their news judgment as they seek validation of their choices for soft news. Audience analytics could, in that way, serve as an extra heuristic for journalists to determine whether soft news is worthy enough of becoming news. Further research might focus on the effect of the presence of soft news elements in hard news stories on audience metrics. For instance, does a more personal story about the private life of a politician yield more public interest then a story about his/her policy stands? Our experimental design allows studying to what extent political journalists are encouraged to "soften" their hard news approach.

Third, our hypothesis concerning the interaction between audience analytics and tone of news was rejected. Journalists did rank positive news items with positive analytics higher, but the effect seemed more salient for negative news. The effect was, however, insignificant. A plausible explanation for the insignificance of this result could be that the negativity bias that already exists among journalists is reinforced when journalists' judgment is confirmed by the metrics. Research dating back to the 1950s has stated that media are inclined to overplay and emphasize negative news items (Gieber 1955). Due to this ubiquitous "negativity bias" in the news, journalists could feel less ambiguity when it comes to defining the newsworthiness of negative news items. Journalists could hence rely more on "instinct" and practice rather than that they need audience analytics to inform and endorse their decisions about the merit of negative news stories.

Overall, we can confirm that real-time analytics do influence story placement. At the same time, our results indicate that audience analytics are not completely reworking or overruling traditional news practices or journalists' gut-feeling but rather influence the professional judgments on the newsworthiness of news stories in specific circumstances. So, the idea that journalists across the board are guided by the numbers and driven by a market logic should be put in perspective. This study rather nuances the concern in the literature that increased reliance on audience analytics will accelerate tabloidization and lead to a dumbing down of news content (Hanusch and Tandoc 2017; Nguyen 2013). The effect of audience analytics is only significant for soft news, implying that audience analytics mainly provide yardsticks of newsworthiness when the value or relevance of news is less clear.

Despite the significance of our findings, the research is constrained by several limitations. First, as with any experiment, we have to be cautious about external validity. The survey experiment allowed us to study the use of audience analytics in relation to newsworthiness in a controlled experimental setting, which, according to Helfer and Van Aelst (2015), is an advantage over traditional gatekeeping studies. Nonetheless, we have to bear

the artificiality of experimental research in mind as much as the fact that the reality of the news selection process is more complex. As Shoemaker and Reese (1996) have argued in their hierarchical model of news making, there is a wide array of influences on journalists' decisions, both inside and outside the media organization. In this experiment, we measured journalistic behavior by asking journalists to behave as editors. Future research should try to go one step further and develop a design that resembles closer to the daily setting in which journalists operate. For instance, by manipulating characteristics of a political story and testing how this would affect audience responses. Yet, our study also measured journalists' exposure to audience metrics. With three out of four journalists in our sample that has at least occasional access to audience data, we argue that we can actually make a rather strong claim concerning the external validity of our experiment. However, putting the survey in a Chartbeat direction might also have raised social desirability among the respondents.

Second, as our study only measures political journalists in Belgium, it cannot be generalized to other types of journalists or journalists working in another context. For instance, the strong position of the public broadcaster in the Flemish medialandscape, less driven by profit and audience maximization, might create a news environment that tempers commercial pressures and the role of audience metrics (Soroka et al. 2012). However, since many studies in Western democracies have found evidence for the centrality of analytics and the universality of gatekeeping practices in newsrooms across countries, we generally expect that experimental studies in other media markets will find similar results.

Third, our research design only tested the influence of audience metrics based on two clearly distinct news topics (unemployment and a TV series announcement). The question remains whether their effect would be different if we included more or different topics in the analysis. In particular, the choice for a classic and substantial topic such as unemployment might have downplayed the effect of audience data. Including a more diverse set of topics would also provide more insights on the extent to which audiences' and journalists' perceptions of newsworthiness is issue-dependent. Further research could also test whether audience metrics might matter more or less for stories about politicians and politics itself (e.g., a political scandal) or news stories that blend hard and soft news elements (e.g., politician participating in a TV show). Fourth and finally, we only tested how audience metrics related to the hard–soft and positive–negative distinction. However, these alone do not represent the range of criteria that affect news selection. Future studies include more and different news factors to see how these classical (implicit) determinants of newsworthiness interact with actual data on what news stories the public consumes. Moreover, other scholars can compare the potential divergent perceptions of individual journalists working for legacy media on one hand, and the digital editions of these newsrooms on the other.

In conclusion, this experiment seems to indicate that journalism has not hit rock bottom. Like Nelson and Tandoc (2018), we noticed that individual journalists have managed to maintain some level of autonomy. This feeling of autonomy might be lower for digital editors who are more firmly committed to using analytics in their daily routines and practices. Furthermore, if journalists have to meet certain click-goals, as is gradually being practiced in various newsrooms, then these journalists can probably also be expected to act differently than journalists in a non-metrics driven newsroom.

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Appendix

Table A1. Experimental conditions.

Condition	Hard-soft news	Positive-negative news	Chartbeat	Headline
1	Hard	Positive	⌃	Half of young unemployed people find a job within six months
2	Hard	Positive	⌄	Half of young unemployed people find a job within six months
3	Hard	Negative	⌃	Half of young unemployed people don't find a job within six months
4	Hard	Negative	⌄	Half of young unemployed people don't find a job within six months
5	Soft	Positive	⌃	New season of "De Mol" in 2019
6	Soft	Positive	⌄	New season of "De Mol" in 2019
7	Soft	Negative	⌃	No new season of "De Mol" in 2019
8	Soft	Negative	⌄	No new season of "De Mol" in 2019
9	Hard	Positive	None	Half of young unemployed people find a job within six months
10	Hard	Negative	None	Half of young unemployed people don't find a job within six months
11	Soft	Positive	None	New season of "De Mol" in 2019
12	Soft	Negative	None	No new season of "De Mol" in 2019

Table A2. Participants in each condition.

Variable	N
Chartbeat	
Increasing popularity	55
Decreasing popularity	54
Control	27
Tone	
Positive	63
Negative	73
Type	
Hard news	69
Soft news	67

Table A3. Constant headlines.

	Headline	Chartbeat
1	Nuclear exit in 2025 feasible and affordable	⌄
2	New final attainment levels in education show too little ambition	
3	Rock Werchter almost completely sold out	
4	Overpopulation in Belgian prisons remains a problem	⌃