Agenda Cueing in Aggregated Newsfeeds

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AGENDA CUEING IN AGGREGATED NEWSFEEDS

A Dissertation

Submitted to the Graduate Faculty of the
Louisiana State University and
Agricultural and Mechanical College
in partial fulfillment of the
requirements for the degree of
Doctor of Philosophy

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The Manship School of Mass Communication

by
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The web is more a social creation than a technical one.

– Tim Berners-Lee, in *Weaving the Web*.

It's a website. It doesn't have integrity.

– Will McAvoy, portrayed by Jeff Daniels, in Aaron Sorkin’s *The Newsroom*. 
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ABSTRACT

This dissertation brings together the findings from three experimental studies that seek to understand how exposure to information in an online news aggregating portal can influence users’ perceptions of the relative importance of problems facing society. Theoretically, this investigation relies on two foundational ideas. One is that in today’s high-choice, multi-source media environment communication flows are curated by a variety of gatekeeping actors, such as algorithms and fellow users. Individuals can have varying attitudes toward and perceptions of these gatekeepers, which can influence the effects of exposure to online information, including agenda-setting outcomes. Another is that users of digital news, facing a nearly infinite supply of information, rely heavily on presentation cues embedded in news platforms’ interfaces to navigate the news landscape and make sense of the messages they encounter. These powerful features can communicate the identity of gatekeepers who curate the newsfeed, as well as particular mechanisms of curation.

Using the data from a longitudinal experiment where participants were exposed to a dynamic, constantly updated news portal populated with real news, the first study tests the comparative effects of two user-sourced cues representing different logics of content selection. The analysis does not support the expectation of differential agenda-setting effects, yet this finding could be the result of study design that did not allow for sufficient control of all the aspects of the treatment. The second experiment is a pilot test of an alternative experimental design that allows for a cleaner test of interface agenda cues’ differential effects. Its success in influencing users’ issue priorities paves the way for the main experiment that utilizes the same treatment mechanism. This study reveals that different types of interface agenda cues can influence users’ perceptions of issue importance differently in the news portal context. Consistent with the agenda cueing hypothesis, users high in gatekeeping trust are revealed to be especially susceptible to media agenda cues. In
conclusion, I argue that interfaces of digital platforms should become the subject of public scrutiny, while news literacy interventions should focus on raising people’s awareness of how digital platforms aggregate and present the news.
CHAPTER I. SETTING PUBLIC AGENDA IN THE AGE OF DISTRIBUTED DISCOVERY

Introduction

One of the major structural changes that the advent of digital news era introduced into media systems across the globe has been the transformation of the ways in which audiences access news content. In the age of print newspapers and network television, the relationship between publishers and news consumers has been a direct one. Distribution channels have been a scarce and costly resource that only a limited number of professional news organizations had access to. Consumers’ choices were largely confined to a handful of mainstream outlets, whose editors served as the ultimate judges of what stories and topics large swaths of readership saw in the news.

As the majority of the developed world’s population has gone online during the first two decades of the twenty-first century, the cost of distribution became marginal, while the centralized structure of news discovery dissipated. Instead of accessing the news through a few direct distribution channels pre-determined by publishers, media consumers across the globe increasingly rely on digital intermediaries like social networking sites and news aggregators to access news (Newman et al. 2019). Some scholars of communication conceptualize this shift as a move from direct discovery to distributed discovery (e.g. Toff and Nielsen 2018).

The emergence of distributed discovery as a dominant mode of news access has had dramatic consequences for both media industries and the public. The enormous role of online platforms such as Facebook and Google in news distribution upended traditional business models as it diminished media organizations’ control over distribution channels. Publishers found themselves in need to contend with delivery platforms’ newfound power of commanding audiences’ attention and thus controlling revenue streams in a media economy that relies on monetizing commodified attention (Nielsen and Ganter 2018). Despite the
initial promise of democratizing the online public sphere by widely dispersing communication power, the centripetal forces inherent to the internet attention economy eventually led to a new kind of centralization with a handful of the most trafficked websites concentrating a large share of the online audience (Hindman 2018; Hurley and Tewksbury 2012). As a consequence, a significant share of media consumers have come to receive online news from a small number of digital platforms – both social like Facebook and Twitter, or more specialized like Google News or Yahoo!News – redistributing content produced by a variety of news organizations.

These tectonic shifts in the structure of news delivery systems notwithstanding, one crucial societal function of the media remained in place: the capacity to establish a shared understanding of social reality and the “common core” of the most important issues in the public sphere. In other words, in the digital age news media remained powerful agenda-setters. Numerous empirical studies have supported the notion that media agenda and the public’s issue priorities are highly correlated (Feezell 2018; Iyengar and Kinder 2010; McCombs 2004; McCombs and Shaw 1972; Moeller et al. 2016; Wanta and Ghanem 2007). Proliferation of social newsfeeds and algorithmic recommendation systems sparked widespread concerns about the potential for online news users, especially those with strong partisan preferences, to get trapped in “echo chambers” and “filter bubbles” of like-minded information (Sunstein 2009; Pariser 2011). Although such detrimental effects of online news exposure were primarily discussed in the context of political polarization (both attitudinal and affective), some researchers also theorized that the same logic could be applied to agenda-setting processes as well, describing a scenario where consumers of personalized political news can form widely diverging understandings of what issues are of utmost importance to society, depending on their political and ideological preferences (e.g. Arceneaux and Johnson 2013).
Yet, empirical evidence in support of the echo chamber hypothesis remains spotty, and many researchers have questioned its validity based on a more nuanced understanding of online media consumption than the one that informed initial alarmist accounts. In particular, several recent aggregate-level studies found that most of online news users receive a relatively mainstream and ideologically centrist selection of content (Guess et al. 2018, Dubois and Blank 2018). As Hurley and Tewksbury note, a situation where a small set of most popular websites dominate online news landscape is conducive for maintaining a certain degree of knowledge uniformity (Hurley and Tewksbury 2012), a notion that highlights the way in which digital platforms today play an important role in setting a cohesive public agenda. Major news aggregators and search engines, for example, give an overwhelming preference to coverage produced by the largest mainstream publishers (Diakopoulos 2019). It appears that the emergence of new ways of news discovery and new actors keeping the metaphorical gate did not result in dramatic shifts in the types of news content that the majority of consumers get. However, it is still critical to understand how exactly the new gatekeepers contribute to building the public’s shared understanding of social reality in the age of distributed discovery and digital platforms.

Journalists and editors, especially those employed by major news organizations with massive online audiences, still have a lot of say in what becomes news that reaches the majority of the public, as described by traditional models of gatekeeping (White 1950). What is different now is that their power to set the public agenda is no longer monopolistic, as the new patterns of news discovery have enabled novel gatekeepers to shape online information flows as well. In social news contexts, such as on Facebook and Twitter, each individual user’s newsfeed is heavily shaped by what their social connections choose to share or endorse. In services specifically designed to provide on-demand access to information of interest, such as search engines and news portals, the output tailored to each user individually
is determined by complex proprietary recommendation algorithms and can be informed by users’ prior choices. Thus, these new sociotechnical systems add a second layer of information filtering agents on top of the level performed by traditional journalistic gatekeepers (Cossiavelou and Bantimaroudis 2009). Human and algorithmic gatekeeping are not mutually exclusive: in fact, most of news aggregating platforms feature some combination of the two. In most of social networking sites’ newsfeeds, the order and visibility of user-shared content is determined algorithmically; conversely, news portals like Yahoo!News, where the dominant news selection mechanism is algorithmic, often contain interface features that present certain stories as endorsed by other users (e.g. the “Most popular” sidebar). As of November 2019, every major digital platform (Facebook, Google, Apple, Twitter and even LinkedIn) also employed an internal newsroom whose job was to define and curate news, aided by algorithms (Rashidian et al. 2019) – the fact that highlights the synergy between human and algorithmic gatekeepers in the modern media ecosystem.

Understanding the processes whereby exposure to digital news influences the public’s issue priorities requires factoring in the role that new gatekeepers play in online media consumption. As a learning process, agenda setting entails reception and internalization of information about social reality that flows from news media to their audience. Decades of research on source credibility suggest that perception of whom the message is coming from can determine the likelihood of its content being accepted and internalized (Metzger et al. 2003; Messing and Westwood 2014; Thorson and Wells 2016). Introduction of an additional tier of gatekeepers that occurs in multi-source news environments can be consequential for agenda setting outcomes in at least two interrelated ways. On the supply side, it can result in changes in the selection and visibility of news content available to consumers. On the receiver side, it can alter users’ perceptions of the information they actually encounter and thus affect the development of their problem importance judgements. In this study, I
primarily focus on the latter puzzle. My broad question is: How do users of digital media construct their perceptions of social reality based on the information that they encounter in distributed, multi-source media environments?

Before addressing this question empirically in the following chapters, I establish a conceptual foundation for the analysis by reviewing several areas of scholarly literature that provide theoretical treatment of the processes involved in production and consumption of online news. Describing the changes in the structure of news supply, I focus on theoretical advancements in gatekeeping theory, a strain of scholarship that has recently documented decentralization of news filtering processes in digital media environments. Scholars of online communication have contended that, unlike in the era of direct discovery where information flows were tightly controlled by political and media elites, recent decades saw the rise of alternative kinds of gatekeeping mechanisms, such as social curation and algorithmic aggregation (Thorson and Wells 2016). Potential effects of these new types of gatekeeping on news consumers remain underexplored, especially when outcomes like perceptions of the relative importance of social issues are concerned. The way users can learn about the identity of gatekeepers behind messages that they encounter online is through certain features of websites’ interfaces. I argue that, given the exponential growth of the amount of information available online, individuals navigating multi-source media environments increasingly rely on presentation cues embedded in digital interfaces, including those that attribute newsfeeds’ curation to different agents. In order to generate theoretical expectations with regard to agenda-setting effects of such interface features, I review the literatures on the effects of presentation cues and, more specifically, the effects of interface cues as it is addressed in computer-mediated communication scholarship.
Second-layer gatekeepers: Users and algorithms

In most general terms, gatekeeping is the process of “deciding which messages to send to others and how to shape them” (Shoemaker et al. 2017). Since David White’s groundbreaking 1950 study, where he investigated what types of content a newspaper editor decided to publish and for what reasons, the information gatekeeping function in society has been predominantly associated with the work of news professionals. Mass communication scholarship focused on the press’ various organizational and social practices that informed journalists’ and editors’ decisions on what messages to include in news reports (Cook 1998; Shoemaker and Vos 2009). The nearly uncontested gatekeeping power of mainstream news media allowed them to exert massive influence on the public agenda, as well as to frame the debate on particular issues.

Rapid digitization of media in the first two decades of the twenty-first century challenged the old gatekeeping models. Some scholars contended that the extant gatekeeping theory failed to describe the changing dynamics of the process, most notably with regard to the emergence of users and algorithms as its powerful actors (Wallace 2018). Affordable online publishing tools and the rise of social news platforms democratized the production of messages that could be seen by a wide online audience, essentially making every user with a computer connected to the internet a potential publisher. Information was no longer scarce – in fact, with nearly limitless supply of information the audience’s limited attention became the key commodity of the news economy. Whoever were to stand in between the messengers and the “gated” in the new media environment could not fully control production and distribution any longer – instead, the new gatekeeping power now resided in the ability to direct users’ attention to certain pieces of information, in others words, to make content more visible online. Visibility in this context refers to the amount of effort that individuals have to apply in order to locate a piece of information (Leavitt and Robinson 2017).
Granted, journalists and editors of mainstream media outlets remain powerful arbiters of what news a lot of people end up seeing. Large publications of the caliber of the New York Times and Wall Street Journal still confer a lot of visibility on anything they choose to feature in their articles simply by the means of their highly recognizable brands, lasting reputations, and massive loyal audience. Yet, some scholars have argued that on aggregate the role of journalism is evolving from the classic notion of gatekeeping toward “gatewatching” – a process whereby journalists increasingly republish and recontextualize content that was created online by someone else, emphasizing the increasingly collaborative nature of news production and filtering (Bruns 2005). Furthermore, both on social networking sites like Facebook and Twitter, and social news platforms such as Reddit, visibility of even mainstream-sourced publications to individual users heavily depends on two other classes of gatekeepers: users and algorithms.

The rise of individual users of digital platforms as gatekeepers is enabled by affordances of increasingly social news environments. Social networking sites like Facebook originally emerged as spaces for primarily interpersonal communication, but quickly evolved to serve a variety of additional functions, including broadcasting news content to audiences such as one’s own followers or members of online communities the user belongs to. Individuals on social networks can perform several types of actions that affect visibility of information. For example, Choi (2016) distinguishes two fundamental categories of such actions: endorsing, or “externalizing” content (e. g. by “liking” it), and “recontextualizing,” meaning reposting it (Choi 2016). Social news websites – classic examples of which category include Reddit and digg.com – explicitly rely on user feedback mechanisms (“upvotes”) to rank posts and thus determine their visibility to the platform’s users (Lerman 2006; Leavitt 2016). Such collaborative forms of news filtering and diffusion prompted scholars of online communication to update theories of gatekeeping so as to accommodate the new, dual role of
the audiences as both the “gated” and the active participant in shaping information flows – for example, as in Barzilai-Nahon’s network gatekeeping framework (Barzilai-Nahon 2008).

While user-centered processes of collaborative filtering and decentralized gatekeeping received significant scholarly attention during the past two decades, the role of non-human, algorithmic agents in shaping online information flows has been a much smaller field of investigation until recently (Wallace 2018). Following the watershed moment of the 2016 U.S. presidential election, when the social and political power of technology platforms came under close scrutiny of the public, regulators, and academics, the role of technology companies’ proprietary algorithms in constructing social reality has come to the center of both scholarly and policy debate.

Recommendation and selection algorithms today underpin every major online information delivery system, from search engines and news portals to social networking and e-commerce websites. The scope of their societal influence has been described in terms of algorithms as the new form of social institutions (Napoli 2014) and the information society’s governance structures (Just and Latzer 2016). Algorithms’ essential function is to match individuals with the most relevant selection of information, based on explicitly (e.g. search term) or implicitly (e.g. browsing history, prior searches, cookies) provided user input. In the digital news economy, algorithms are the primary tool of capturing audience’s attention as platforms race to increase the time users spend on their websites (Hindman 2018). In pursuit of this goal, recommendation algorithms exert enormous influence on relative visibility of information, as they determine which posts and articles are presented to each of the platform’s users, and in what order. At the same time, the logic of algorithmic selection is vastly different from the criteria historically applied to potentially newsworthy information by human gatekeepers. In lieu of traditional news values such as novelty and drama, one study identified criteria such as “friend relationships, explicitly expressed user interests, prior
user engagement, implicitly expressed user preferences, post age, platform priorities, page relationships, negatively expressed preferences, and content quality” as primary determinants of what posts have higher chances of being featured in a user’s Facebook feed (DeVito 2016, p. 1). Since these recommendation systems are developed by for-profit commercial entities with the primary goal of maximizing user engagement, many of their social effects are essentially externalities often unforeseen by their architects.

As mentioned afore, in most digital media environments human and algorithmic forms of filtering coexist, as both are at work in shaping online information flows. In their seminal article, Kjerstin Thorson and Chris Wells advanced the conceptual framework of curated flows to describe the reality of networked individuals’ media consumption. They contended that previously dominant top-down models of centralized information distribution are no longer an accurate description of how networked individuals get exposed to news. In this paradigm, a fundamental activity that defines news exposure and consumption in digital media environments is curation, understood as the “production, selection, filtering, annotation, or framing of content” (Thorson and Wells 2016, p. 310). Multiple entities can simultaneously perform curation of the same individual’s information flow, from traditional newsmakers to other users, advertisers, and algorithms. In this model, the distributed and contingent process of curation effectively replaces the gatekeeping function.

Whereas Thorson and Wells use the term *curation* broadly, to denote both human-performed and algorithmic selection of information, other researchers distinguish between curation as human activity and aggregation as a fully automated process. For example, scholars focusing on the sociology of digital news consumption see curation as a collection of strategies that people employ as they simultaneously navigate the abundance of available information and perform the work of online self-presentation. In this vein, Jenny Davis distinguishes between productive and consumptive curation: selecting materials to document
and share as a productive aspect of the process, and adjusting one’s own incoming information flow as a consumptive aspect (Davis 2017). Aggregation, on the other hand, is often understood as automated, machine-driven selection and reorganization of materials to display (Bakker 2012; Chyi et al. 2016).

The balance between curation and aggregation varies across different digital media environments. Some spaces present predominantly human-curated information flows, with algorithms still aiding in ranking and displaying the content posted, endorsed, or reposted by the user’s social contacts or members of online communities they belong to. Social networking sites like Facebook and, to a lesser extent, social news platforms like Reddit belong in this category. Other online platforms’ principal function is aggregation and presentation of already published content. Primary examples here are news portals such as Google News and Yahoo!News, as well as news apps like Apple News. Human curation can still play a role in these sociotechnical systems, which sometimes partly rely on editors’ judgement to select or categorize news items, or feature the content based on popularity metrics such as the number of views, endorsements, or comments. The fundamental difference in the nature of human curation on these platforms, however, is that in aggregation-first systems it is largely depersonalized.

Naturally, users’ expectations of the content they encounter in these varying contexts can be different, and so can be perceptions of news media, other users, and algorithms as gatekeeping authorities. For instance, user endorsement can elicit different effects in the context of socially ranked Reddit feed compared to aggregate metrics such as number of views or comments in a news aggregator feed. This warrants separate empirical investigations of the effects of various types of novel gatekeepers on perceptions of relative social issues’ importance in more “social” versus more “aggregated” digital news contexts. This study is focused on the latter type of information environments, where content
aggregation is the primary function of the platform, best exemplified by news portals and apps such as Google News and Apple News.

**Gatekeeping by news portals and aggregators**

News portals are multi-source media environments, meaning that they index, repackaging and redistribute content sourced from a wide array of third-party online publishers. Early conceptualizations of portal websites emphasized their role as “gateways” to online content that are instrumental in “establishing gatekeeping guidelines and streamlining information flow” (Kalyanarman and Sundar 2008, p. 239). Taking this point further, Beam and Kosicki argued that web portals help individuals to deal with information overload by organizing the virtually limitless supply of content available online in a digestible way (Beam and Kosicki 2014). Implied in these definitions is the gatekeeping function of online news aggregating sites that serve as information hubs for their users. The source of gatekeeping power here is not the control of news production, but rather the ability to efficiently select and present the most relevant content that is already published online. Some scholars highlighted the emerging tension between journalists and news aggregators as new gatekeepers, who have come to challenge news professionals’ “presentation authority” (Carlson 2007).

One of the primary tools that online news portals utilize to increase user engagement is algorithmic personalization of the information flow according to individuals’ interests (Beam and Kosicki 2014; Dylko et al. 2018; Hindman 2018; Kalyanarman and Sundar 2006). Although generally news aggregation can entail some combination of automated indexing and editorial judgement (Chyi et al. 2016), some of the world’s most trafficked news aggregating services are fully automated. Often they are extensions of search engines (Google News, Yahoo!News) that use complex ranking algorithms to determine a selection of news stories displayed to each individual user. For instance, here is how Google News
describes its news selection procedure: “Our articles are selected and ranked by computers that evaluate, among other things, how often and on what sites a story appears online. We also rank based on certain characteristics of news content such as freshness, location, relevance and diversity” (Google News, n.d.). In the case of Google News, the algorithm appears to be heavily favoring high-quality content published by top mainstream news organizations. One 2019 study found that just 20 mainstream news publishers comprised more than half of Google’s Top Stories section output, with three largest contributors being CNN, The New York Times, and The Washington Post with more than a quarter of all the stories returned (Diakopoulos 2019).

The role of user-driven curation in news portal environments is usually secondary. It can vary depending on a particular service or national context: for one, in South Korea, where news portals serve as one of the major venues of news consumption, largest online aggregators allow for users to leave comments below news stories (Lee and Jang 2010). In the U.S. context, however, major news portals either completely forgo affordances that indicate other users’ reactions to content (Google News) or rely on non-specific, aggregate metrics of user engagement (Yahoo!News’ “Trending” sidebar; MSN’s “Trending Now” tab). Yet, given the fact that these services constantly update their information delivery systems and interfaces, it is feasible that they could introduce more “social” affordances at any moment.

From there, I can distinguish several types of entities that can exercise gatekeeping power in news portals’ feeds, and are therefore capable of influencing their users’ perceptions of the relative importance of societal problems. News media professionals who produce the original coverage featured by online aggregators remain first-level gatekeepers, as the studies reviewed above suggest that news portals largely reflect the agenda of mainstream media. Digital platforms’ proprietary algorithms that tailor news output to the tastes of a particular
user are important second-level gatekeepers, since they largely determine the visibility of the content to the public. In some cases, users of the portal can act as gatekeepers as well, provided that there are affordances in place allowing them to either explicitly (commenting, liking, upvoting) or implicitly (having their online behavior metrics included in aggregate indicators) endorse certain news articles.

In order to generate expectations about users’ potentially differential susceptibility to agenda-setting influence of these gatekeeping agents, I first have to establish whether news consumers perceive them as separate entities that can have diverging agendas. This is because taking agenda cues can be viewed as a persuasive process moderated by users’ perceptions of who the message comes from (see the discussion of psychological models of agenda setting in Chapter V). Prior research supports the notion that user evaluations of information online largely depend on what receiver believes to be the source of the message (Flanagin 2017; Sundar and Nass 2001). Furthermore, persuasive effects of communication depend on factors such as quality, authority, and likability of sources, all of which are dimensions of a more general construct of source credibility (Pornpitakpan 2004).

In multi-source online environments like news portals, by definition, the concept of source credibility is no longer meaningful in its original form. In a newsfeed comprised of messages coming from dozens of publishers, credibility that the user attaches to a single source has much less explanatory power compared to the era of direct discovery, at least if the individual doesn’t have a strong preference – for instance, on political grounds – for some sources over others. In this situation, source credibility can be ascribed to more general entities than a single publisher, such as the aggregating platform itself, the mainstream media in general, or other users of the portal curating the feed. A useful innovation is the concept of the website’s sponsor – an entity whose logo appears on top of the page and whose credibility has been shown to influence perceived quality of online information (Flanagin and Metzger
2007; Westerwick 2013). For example, if a person believes that Google provides high-quality search output, they may assume that the news content found in Google News is more credible than similar selection found on an obscure website whose sponsor lacks Google’s stature.

When it comes to constructing perceptions of social issues’ importance based on the news content found in news portal, it is reasonable to expect that people will be more (or less) likely to base their judgements on agendas that different gatekeepers present to them, depending on how credible they find these gatekeepers. One possible empirical question that can be posed is this: Will news portal users accept problems prioritized by the curation any of the three gatekeepers – mainstream media, algorithms, or other users – as more important to society? One assumption that this question bears is that users perceive these three entities and their agendas as distinct.

This, however, is not warranted. Curation by other users in the form of popularity metrics and other interface features is relatively easy to pinpoint, and a plethora of past studies demonstrated that this type of endorsement has powerful effects on evaluation of online information (more on the mechanisms of interpersonal influence in the next section). Telling apart the other two types of gatekeepers that command communication flows in news portals, mainstream media and recommendation algorithms, can be more problematic. When readers see intensified coverage of particular problems in a news aggregator feed, do they believe that it is the aggregator or the news media at large that emphasize these issues?

Research on news consumers’ perceptions of algorithmic curation remains scarce. One recent experimental study found that when algorithmic judgement is pitted against human-generated recommendation, people are more likely to heed the machine’s advice (Logg, Minson, and Moore 2019). In the context of news selection, Thurman and colleagues reported the result of a large-scale, 26-country survey, which suggested that generally individuals prefer algorithmic recommendation over editorial judgement as a better way to
access media content (Thurman et al. 2019). At the same time, those studies that attempted to assess how aware news users are of the role that algorithms play in shaping their information selection in distributed news environments revealed that a significant share of the audience have a rather vague understanding of the processes of algorithmic gatekeeping, if any at all (Eslami et al. 2015; Eslami et al. 2016; Toff and Nielsen 2018). This leads me to expect that for majority of news portal users most visible stories featured in the top section of, say, Google News represent the aggregated agenda of the mainstream news media rather than the agenda specifically constructed by the Google News recommendation algorithm. Thus, in the empirical chapters of this study, I will test hypotheses comparing the agenda-setting influence of the mainstream news media, as manifested in news portal’s algorithmic story selection, with that of user-curated selections. I now proceed to reviewing theoretical frameworks that describe the effects of interface cues, including those that attribute curation of online messages to various actors, on users’ evaluation of information in online environments.

The role of cues and heuristics in online news environments

The supply of information in digital environments is virtually infinite, yet people’s ability to attend to and process online messages is not. According to Lang’s Limited Capacity Model, cognitive resources that humans allocate to processing and storing mediated messages are limited, leading consumers of digital news to employ cognitively economical strategies when assessing information they encounter (Lang 2000). In practice, it means that most people, most of the time do not process every aspect of every available message, but pay attention to its certain characteristics in order to efficiently decide whether to engage with the message or not, and what to make out of its content. This principle holds not just when users leisurely browse web portals or social media feeds to see what’s new, but also when they conduct proactive information searches. Information foraging theory posits that the likelihood of a person to visit a particular webpage is a function of how much useful information they
believe they can find on that page, and the perceived cognitive cost of such interaction (Pirolli 2005). In other words, users optimize the utility of digital information by selectively allocating their attention.

Dual-process models from the field of psychology provide a useful theoretical lens to examine how news users interact with mediated messages. Petty and Cacioppo’s Elaboration Likelihood Model (ELM) describes two distinct ways of processing stimuli: the more cognitively taxing central route, which presumes thoughtful consideration of the message content, and the peripheral route, which relies on a more superficial assessment of the message’s qualities and attributes that take less effort to process. Individual’s engagement with the topic of the message acts as the crucial factor in deciding whether it gets processed centrally or peripherally, such that when interest in the topic is high, it is more likely to be processed thoughtfully. In the case of peripheral processing, rather than thoroughly evaluating the message on the merits of its content, individuals prefer to focus on more superficial and easily accessible features, such as source label, medium, format, or other similar surface properties. This mode of stimuli processing relies on mental shortcuts, or heuristics, which interact with judgmental rules already stored in memory to facilitate making decisions efficiently (Petty and Cacioppo 1986).

Heuristics can be presented in a form of “if-then” statements. For example, “if a message is too long, I’m not going to read it” is a heuristic that is relevant to how online news users make judgements about selecting stories to read. Fiske and Taylor (2008) define heuristics as “mental shortcuts that are used to reduce complex cognitive tasks into simple mental operations that allow us to make judgments fairly efficiently and accurately.” Cues, in turn, are conceptualized in media psychology literature as any features of a message that trigger operation of a heuristic (Sundar 2008). Although they are closely related, cues and heuristics are not the same; as Bellur and Sundar (2014) put it, cues “contain” heuristics. It
should be noted that cues are not exclusively effective when processing is peripheral: an individual can rely on heuristics when engaging in central processing as well (Chen and Chaiken 1999).

The role of cues, in particular those that indicate the source of the message, is especially prominent in multi-source digital media environments. Now that curation of communication flows is driven by a multitude of gatekeepers, a big part of assessing the quality of a message is credibility of its source, signaled by a variety of cues. In this situation of “source ambiguity” (Flanagin 2017) where a platform, a publisher, or a user who shared a piece of content can all be perceived as its source, credibility can be ascribed to any of them. Relevant to the discussion of two major types of actors that perform gatekeeping functions in news portal feeds – mainstream media aided by recommendation algorithms and portal users – are two distinct types of cues: those that indicate authority or superior quality of the source, and those that indicate social endorsement.

Researchers have long observed that outcomes such as perceived message credibility, as well as likelihood of selection of mediated messages and internalizing their content are enhanced when the recipient believes that it is coming from a reputable, authoritative source (Flanagin and Metzger 2007; 2011; Winter and Kramer 2014). A recent eye-tracking experiment that examined the determinants of political message selection in a Facebook newsfeed revealed that users not only chose to read articles from high-credibility sources more readily, but also spent more time reading them (Sülflow, Schäfer, and Winter 2019). This could be one of the key reasons why major news aggregators that seek to maximize user attention and time spent on their platforms overwhelmingly favor content produced by reputable mainstream publications. The way platforms signal this type of credibility can range from simply placing reputable publications’ brands next to story headlines to including special interface features (such as Top Stories section) where this content is more visible.
Another distinct yet powerful source of credibility is social influence. Prior research indicates that consumers of online news can find messages more credible and be more likely to select them if they believe that these messages were endorsed by others. Sundar and Nass (2001) conceptualize interface cues that trigger these “social” heuristics as bandwagon cues. Studies manipulated presence or absence of social recommendations below each news story (Knobloch-Westerwick et al. 2005; Messing and Westwood 2014), or presence or absence of specific elements (sidebars, “recommended” sections, etc.) on the webpage (Yang 2016). All these studies are consistent in providing evidence that the presence of such recommendation-based cues increases the rates of exposure to the stories highlighted. Moreover, Messing and Westwood find that social endorsements outperform as powerful a cue as source partisanship in the process of online news selection. In sum, previous scholarship documented that bandwagon cues enhance news consumers’ likelihood to select stories if they were in some way endorsed by other users, and in some cases increase the overall number of stories selected, thus benefitting the delivery platform.

At the same time, it should be noted that the effects of both types of cues are contingent upon the context and other potentially relevant variables. For example, in an experiment by Anspach that examined the effects of social endorsements and discussions in Facebook feed on users’ likelihood to choose news stories to read, only cues coming from friends and family members were shown to be effective. Endorsements by unknown users did not increase users’ likelihood to click on stories to read (Anspach 2017). This suggests that expectations of the information encountered on various digital platforms may differ, and so can perceptions of similar types of curation across different digital contexts. Wallace observed that in online spaces associated with quality journalism users expect the content to adhere to traditional journalistic values (Wallace 2018). In the context of a news aggregator,
therefore, cues that point to high quality of a source can be more powerful than in the newsfeed of a social networking site, and vice versa.

In addition to the quality and agency dimensions, interface cues can hint other kinds of information about online content. Comparative effects of various functional types of public endorsements remain a somewhat understudied area. For example, a further distinction could be made between the cues of collective interest (e. g. number of views) and cues of collective liking (e. g. number of upvotes). However, most of the empirical studies to date haven’t specified the exact nature of public endorsement, focusing solely on making sure that the cue manipulation communicates some sort of collective “recommendation,” i. e. it implies that a certain number of other users have found the message worthwhile. I argue that not only the agency behind such endorsement, but also the nature of endorsement may be a meaningful analytical distinction when examining how different users process information and interact with the media environment. In the empirical chapters of this study, I investigate the effects of two types of bandwagon cues: those that are supposed to indicate other users’ heightened interest to featured stories, or to the fact that other users have chosen to recommend these featured stories as important. Despite the common source of recommendation, these two types of cues are supposed to activate different heuristics. In the case of interest cues, the underlying heuristic could be expressed as “if other people found this story interesting, I should, too,” as opposed to “if other people found this story important, I should, too” in the alternative case.

Cues in agenda setting

The outcomes that the studies reviewed above investigate are primarily related to news selection, attention, and persuasion. There is a paucity of studies examining the effects of interface cues on agenda setting-related outcomes. Yet, I argue that in the context of multi-source media environments the cues that point to the identity of various gatekeepers curating
the newsfeed can also be consequential to the construction of users’ perceptions of social problems’ importance. People can be more or less likely to follow different gatekeepers’ lead depending on how credible they find them, and interface cues are the tool to communicate whose issue prioritizations they observe in the newsfeed.

The dominant trend in current agenda-setting scholarship is to view the construction of the public’s issue importance judgements through the lens of dual-process mechanisms. While earlier studies presumed cognitive accessibility as a key means whereby news media transmit their agenda into audience’s perceived issue importance judgements (Iyengar 1990; Price and Tewksbury 1997), more recent wave of research questioned this premise. Cognitive accessibility explanation failed to find empirical support when this construct was explicitly measured (Miller 2007); instead, evidence emerged that agenda-setting effects of media exposure are moderated by media trust (Tsfati 2003). Scholars advanced several dual-process models suggesting that individuals can form problem importance perceptions both by the means of thorough central processing and peripheral, heuristic processing (Bulkow et al. 2012; Takeshita 2006).

Pingree and Stoycheff (2013) proposed the agenda cueing hypothesis, describing the systematic process, agenda reasoning, as thoughtful internalization of the substantive reasons four social issues’ importance. The heuristic process, labelled agenda cueing, entails a less cognitively taxing route: assuming that the gatekeeper has already performed the necessary agenda reasoning, and accepting their issue prioritizations uncritically. The construct moderating this process is gatekeeping trust – the belief that news media systematically prioritize the most important issues in their coverage. In this model, the amount of attention afforded by the media gatekeepers to a certain problem amounts to the belief that this problem is socially important for those with high levels of gatekeeping trust (Pingree and Stoycheff 2013).
Interface cues fit into this picture in two interrelated ways. Firstly, given the variety of gatekeepers who participate in curation of aggregated newsfeeds, it is possible that users can have different levels of gatekeeping trust attributed to these actors – for example, mainstream media or other users. If this is the case, affordances visible in news portals’ interfaces that attribute curation to different gatekeepers can potentially elicit different agenda-setting outcomes. Secondly, interface cues can be used to convey different gatekeepers’ issue priorities. Prioritizing coverage of certain issues in featured sections of the website – for example, in the “top stories” section or a user-recommended sidebar – could create a perception that either the mainstream media or users think of the problem as important.
CHAPTER II. EXPERIMENTAL APPROACHES TO STUDYING AGENDA SETTING IN AGGREGATED NEWS ENVIRONMENTS

Aggregated newsfeeds in media effects experiments

The hallmark of a news portal is availability of choice between multiple messages coming from many sources. For this reason, news portals and other high-choice digital environments are appropriate vehicles to study agenda setting – a process that presumes continued exposure to communication flows rather than singular messages.

Unlike observational studies that can only reveal correlation between media and public agendas, experimentation allows researchers to untangle causal mechanisms that underlie media consumers’ formation of issue priorities as a result of exposure to news. Yet, in order to ensure validity of the findings, agenda-setting experiments should maintain high standards of treatment realism and, ideally, allow for prolonged or repeated exposure to the stimuli. A gold standard for such experimentation has been set in the pre-digital era by Iyengar and Kinder’s seminal work. In News That Matters, they utilized real television newscasts professionally edited such that bits of stimulus coverage were woven in between the real and timely news recently aired on TV networks. In addition, respondents received this edited coverage every day during the course of a week (Iyengar and Kinder 1987). Conducting a study like this requires significant resources and specialized expertise, which could explain why experimental investigations have been relatively uncommon in the inaugural decades of agenda-setting scholarship.

With digital environments becoming the primary venues for news consumption, experimental research was reinvigorated due to availability of new tools such as custom-built websites and behavior-tracking browser extensions. A subfield of media scholarship that saw major methodological advances related to the use of portal-style newsfeeds is media selectivity research. Naturally, empirical investigations of online news users’ choices had to realistically simulate high-choice media environments, resulting in the emergence of what
Clay et al. (2013) labelled the “mock website” methodological paradigm: the use of custom-made, web-based interfaces that afford users a range of choices of media content while allowing researchers to unobtrusively record their selections. In addition, observed measures of selection behavior are often supplemented by questionnaires designed to gauge relevant attitudinal constructs and provide manipulation checks. This experimental format has become a standard practice in selective exposure research (Unkel 2019).

“Mock websites” commonly have a hub-and-spoke structure, with a main page containing story headlines and blurbs, often along with additional cues that could influence selection, such as source attribution or indicators of social endorsement (Hastall and Knobloch-Westerwick 2013). Links that appear on this home page then lead users to full news pieces of their choice. Depending on the particular context that it simulates, an experimental website can represent a single source (“online news magazine”) or an aggregating platform of some type. For example, studies used this logic to emulate news portals (Sundar et al. 2007; Yang 2016), search engine output (Knobloch-Westerwick et al. 2015) and social media feeds (Messing and Westwood 2014).

Most of these studies were administered as one-shot experiments, often in laboratory settings, which arguably presents less of a limitation when the main outcome of interest is selection behavior, but could become more problematic when studying attitudinal changes that result from news exposure, including formation of problem importance judgements. Understanding of agenda setting as a learning process calls for experimental formats that are more naturally embedded in participants’ everyday routines and ensure delivery of experimental stimuli over an extended period of time. An example of a successful agenda-setting experiment consistent with these principles is the study by Kristin Bulkow and colleagues (2012). In order to test their hypotheses regarding the distinct psychological mechanisms underpinning issue importance judgements of users with varying degrees of
involvement with the issue and media use, the researchers have built a news website where real, timely news stories were interspersed with the coverage of a made-up experimental issue. Participants were required to attend to the website daily for a period of two weeks, but could spend as much time as they wished browsing it. Users took several surveys designed to capture their level of involvement with the issues. Researchers also tracked clicking behavior in order to differentiate “light” from “heavy” users. The data supported their expectations that users with varying levels of issue involvement employ different mechanisms of problem importance formation, and that users who engage with the coverage more in-depth are less susceptible to media cues (Bulkow et al. 2012).

Another powerful strategy to investigate the effects of news exposure in multi-source settings is field experimentation. Field experiments enhance external validity of findings by relying on conditions that closely approximate real-life settings in which causal processes of interest occur (Gerber and Green 2011). Whether a certain research design qualifies as a field experiment hinges on the definition of the “field” and the degree of similarity between the “real” world and the context in which participants involved in the study are examined. While field experimentation remains relatively uncommon in social sciences and communication research in particular, potential external validity gains of using such designs to detect causal relationships are massive.

Although it focuses on political learning rather than agenda setting as a variable of interest, the study by Tetsuro Kobayashi and colleagues (2017) demonstrates the advantages of the field experiment approach in the context of a news portal. Using add-on software installed in participants’ web browsers, the researchers manipulated the proportion of hard news and entertainment-related headlines available to users on the homepage of Yahoo! Japan, the country’s most popular news aggregator. The rest of the portal’s content remained unaltered, providing study participants with the experience that was not noticeably different
from the experience of regular users of the portal. After three months of the experiment, entertainment-seekers exposed to a greater share of political headlines on the portal’s home page reported significantly higher levels of political knowledge, lending support to the researchers’ expectation of the inadvertent learning effect (Kobayashi et al 2017). These results suggest that field experimental designs with prolonged delivery of stimuli present a promising methodological approach in the news portal context.

**PCRG portal panel, 2016-2018**

For three consecutive years between 2016 and 2018, Political Communication Research Group (PCRG) at Louisiana State University’s Manship School of Mass Communication fielded experimental studies that sought to combine the strengths of both the “mock website” approach and field experimentation. At the core of these studies was a novel research tool: a custom-built news portal populated with real, timely news stories, which participants used for extended periods of time. The portal automatically pulled news items from Google News’ Top Stories feed, and a combination of pre-programmed automatic filtering and manual sorting ensured that news stories consistent with experimental treatments were made available to users in respective treatment conditions. Importantly, researchers instructed participants to attend to the portal as their main news source in lieu of the sources they used regularly, aiming to replace their preferred delivery platforms with the experimental portal while maintaining the natural volume of news consumption. Leveraging Google News-sourced media content that respondents would have likely encountered visiting major news aggregating websites on the same day ensured ecological validity of the treatments.

Unlike many “mock websites” used in selective exposure research, the PCRG portal was available to participants online rather than in the laboratory setting, and they were free to log onto it when and where they wished, much like real-life news aggregating platforms. The
news portal was live over periods of five (2017), seven (2016), and twelve days (2018). The experimental platform did not host any content, serving merely as a hub for story headlines that would direct users to the publisher’s website when clicked on. Improving on a common limitation of “mock websites” that often store a limited number of pre-selected or made up news pieces (Clay et al. 2013), the PCRG portal’s newsfeed was updated with real content on top of each hour, resulting in thousands of news items available for users to choose from over the course of the study period.

Real-life digital media organizations and aggregating platforms cannot dictate what messages users consume; the best that they can do is make the content available to the audiences. PCRG portal experiments followed the same logic, as the content manipulations involved increasing or suppressing the amount of stories on certain topics of interest in the newsfeed, or making such stories more prominent using interface features. Utilizing such treatments allowed researchers to assess the effects of increased or decreased availability of certain messages in a high-choice media environment, where some users will voluntary expose themselves to these messages, some will use their presence or frequency as cues while foregoing exposure, and some will ignore them altogether. Using availability of certain content rather than forced exposure to it as an experimental treatment improves external validity of the study since it corresponds more closely to how individuals discover and process messages in real high-choice environments.

PCRG researchers employed the portal panel method to test a variety of hypotheses that investigated both attitudinal and behavioral outcomes. Throughout three studies, they unobtrusively collected indicators of user behavior in the portal such as headline impressions, clicks, and total time spent browsing the portal. Each experiment also included pre- and-post-test survey instruments assessing a range of political and media-related attitudinal outcomes.
Despite incorporating certain features inherent to field experiments, such as voluntary exposure and unobtrusive measurement of some outcome variables, PCRG news portal cannot fully qualify as one. This design does not exactly “unobtrusively assess the effects of realistic treatments on subjects who would ordinarily be exposed to them” (Gerber and Green 2011, paragraph 6). While exposed to realistic treatments, respondents in these experiments (who were recruited via the crowdsourcing platform Mechanical Turk) would not have used the portal hadn’t they been paid to do so. Taking pre- and post-surveys is also something that is not ordinarily part of online news consumption. In order for these studies to be field experiments in the strict sense, Manship researchers would have had to partner with a real news aggregator in order to manipulate its output and somehow measure the resulting behavior of its users, with additional difficulties for examining attitudinal changes resulting from exposure.

PCRG portal method can be viewed as a compromise between the strengths of immersing users in a realistic, ecologically valid news environment and the difficulties of conducting a true field experiment. This methodological approach to studying the effects of exposure to aggregated newsfeeds offers familiar trade-offs previously considered in field experiments literature (e.g. Green and Gerber 2002). Using such a voluntary-exposure design entails a tradeoff: the gains in external validity resulting from realism of the setting and news consumption dynamics come at a cost of some degree of control over the experimental treatments. Because researchers use real news stories from real sources, they are unable to influence all the components of the manipulations. For example, they can assign a participant to a condition where they see an increased proportion of crime stories in their newsfeed, automatically drawn from the Google News RSS, but they do not decide what these news pieces are exactly, as they are constrained by the range of crime stories currently available on Google News. Furthermore, as users click away from the portal to open news stories on the
publishers’ websites, researchers have minimal control over what they see and read, and what media messages actually influence their attitudes and behaviors. Consequently, this introduces a degree of uncertainty with regard to causal components of the treatments.

**Setting public agenda in PCRG portal experiments**

Throughout three iterations of the experiment, the PCRG portal included a variety of treatments designed to influence respondents’ political and media-related attitudes, including manipulations that were hypothesized to produce agenda-setting and priming effects. Some causal connections that the portal was instrumental in revealing included: establishing that the availability of crime news in communication flows influences evaluations of the U.S. president (Kalmoe et al. 2018); demonstrating how a combination of fact-checking and opinion editorials defending journalism can improve several dimensions of media trust (Pingree, et al. 2018); observing how increasing the number of headlines covering scandals around the Trump administration heightens the president’s negative evaluations from in-group partisans (Darr, et al. 2019); supporting the expectation that injecting more partisan-congruent news in the user’s newsfeed improves their attitudes toward the delivery platform (Bryanov et al., in press).

Each iteration of the PCRG portal experiment employed different strategies to deliver agenda-setting and priming treatments to portal users. In the first portal (2016), researchers tested the effects of manipulating the presence and amount of crime-related stories on presidential approval and perceptions of other elite actors. A three-level factor manipulating the presence or absence of news articles coded to contain problems facing the country was created, and participants were randomly assigned to see either the baseline feed containing all the “problem” stories present in Google News feed on that day, a baseline feed but with crime news filtered out, or a newsfeed stripped of any “problem” stories. During the
experimental period, a total of 10774 news stories appeared in the baseline feed, with 2021 news items excluded in no-crime news and no-national problems conditions.

The data indicated that stripping the newsfeed of crime news significantly boosted presidential approval ratings but not approval for Republicans in Congress or Democrats generally, consistent with the idea that Americans hold chief executives uniquely responsible for national conditions. Supplemental analyses whereby respondents were asked to name three most important problems facing the nation supported the notion that those who received the communication flow devoid of crime news were less likely to name crime among the nation’s most important problems (Kalmoe et al. 2018). Thus, the analyses suggested that withholding coverage of certain issues from the news portal feed can influence both perceived importance of societal problems and the related political attitudes.
Figure 1: Interface of PCRG portals in 2016 and 2017

Alternatively, the 2017 portal experiment included a two-level factor that manipulated the volume of news stories covering the alleged collusion between the Trump campaign and agents of the Russian government. Half of participants were randomly assigned to see an increase in the availability of Trump-Russia stories, while another half was exposed to a baseline newsfeed that featured whatever amount of the scandal-related stories naturally occurred in Google News’ Top Stories feed. Thus, the 2017 test for agenda-setting effects relied on the artificial increase in the number of stories covering a certain topic in an aggregated newsfeed rather than on filtering the coverage out.
The effects of heightened frequency of scandal coverage differed across party lines. Republican respondents who saw more Trump-Russia headlines turned out to be more susceptible to the negative effects of their presence compared to Democratic respondents and Independents. Republicans reported lower rates of Trump’s performance approval and more negative emotions toward the president in the increased Trump-Russia coverage condition. Importantly, these effects did not vary across the levels of the key behavioral measure: the number of headline clicks, suggesting that attitudinal changes could result merely from the scandal-related headlines being present in the feed (Darr, et al. 2019).

The third iteration of PCRG portal, fielded in May 2018, included a number of innovations related to influencing users’ issue priorities and measuring these effects. Rather than stripping out content related to certain problems like in the 2016 version, or boosting the volume of the target issue’s coverage the way it has been done in 2017, this time PCRG researchers manipulated the relative prominence of several competing issues in the newsfeed. Accordingly, they used the difference between the experimental issues’ importance scores as a measure of the agenda-setting effect instead of individual problems’ scores. This approach was informed by the notion of a possible “hydraulic” nature of the news’ agenda-setting influence, whereby increases in coverage of one issue can enhance or suppress perceptions of other issues’ importance (Iyengar and Kinder 1987). Based on this logic, researchers also tested for potential effects of news coverage of emphasized problems on users’ perceptions of adjacent social problems.

Another key feature of the 2018 portal is that, for the first time, its interface accommodated several gatekeepers as the sources of newsfeed’s curation. At the center of the first two portals’ interface (as can be seen in Figure 1) was a single, chronological newsfeed that did not provide any additional contextual information about its content beyond source label and time of publication. In 2018, in addition to the main newsfeed, a sidebar with two
distinct logics of content selection appeared on the right, labelled either Trending or Recommended (see Figure 2). In both cases, the source of sidebar story prioritization were real portal users’ actions. The Trending sidebar featured the headlines on which readers recently clicked the most, while in the Recommended condition, supplemented with an upvote button next to every headline featured in the portal, the sidebar displayed the stories that users chose to recommend as important to read.

Figure 2: Interface of PCRG portal in 2018

Conceptually, two different newsfeeds represented manifestations of different actors’ agendas. The main newsfeed remained the way for users to gauge what the news media chose to cover or emphasize; consequently, the presence and volume of certain problem’s coverage in that newsfeed meant to cue the news media’s agenda. The sidebar, whose two versions had respective labels and additional explanatory notes designed to convey the agency and logic of
curation, supplied a user agenda cue. Although theoretically similar to what is called “bandwagon cues” in computer-mediated communication literature (e.g. Sundar 2008), user agenda cues were granted a separate label because they did not necessarily imply collective endorsement of the featured content but simply interest in it, at least in the Trending sidebar.

Accordingly, the researchers enacted two separate agenda-setting manipulations in the main feed and sidebar feed. In the news agenda manipulation, they altered the relative emphasis on three social issues covered in the main newsfeed within a two-level experimental factor. Continuing to use the Trump-Russia controversy as a focal problem, they pitted it against a combination of education and immigration, for the reason that these two topics together received roughly as much coverage the week prior to fielding the study as the salient Trump-Russia scandal. In one condition, the feed included a reduced number of headlines on Trump-Russia compared to what naturally occurred in Google News and an artificially increased number of news items related to education and immigration. In the second condition, these two manipulations were reversed: more of Trump-Russia and less immigration and education.

Experimental manipulation of user agenda also relied on alternating the emphasis on two competing issues. Participants were randomly assigned to either a condition where the ranking of stories on racism was boosted in the sidebar while coverage of guns was suppressed, or to a condition where the opposite was the case. News articles were featured in two versions of the sidebar based on two distinct types of user behavior: headline clicks or upvoting to recommend. In each user agenda condition, these user-driven effects doubled for a boosted issue, meaning that the stories categorized as covering the boosted problem were displayed as if they received twice as much clicks or recommendation upvotes. At the same time, stories on the competing problem were dropped from the sidebar altogether.
Data analyses revealed that both news agenda and user agenda exerted significant effects on user issue priorities and related attitudes. Emphasizing education and immigration over the Trump-Russia investigation on news agenda increased perceived importance of education and immigration relative to the news agenda with the emphasis on the presidential scandal. When guns were featured more prominently on user agenda relative to racism, the difference of these two problems’ importance scores reflected it as well. In the follow-up analyses, however, models testing user agenda as a predictor of perceived importance of these issues separately fell short of producing significant effects, suggesting that the sidebar feed’s influence has been subtle enough to only affect the relative importance of the emphasized and deemphasized problems. Furthermore, consistent with the expectations derived from the group threat theory and the “hydraulic” agenda-setting effects hypothesis, emphasizing racism stories on user agenda also carried over to perceptions of immigration, leading users to regard it as a more important issue.

While the combined user agenda was revealed to be influential in shaping portal users’ issue importance perceptions, prior PCRG analyses only addressed the combined effects of both Trending and Recommended sidebars. My focus on discovering potential avenues for socially beneficial improvements in digital news interfaces, however, leads me to ask: Was there any difference in the observed effects between two distinct logics of content prioritization in the portal sidebar? If online audiences are more likely to be swayed by whatever they perceive others find “clickworthy,” implications for civic discourse could be bleak. If the opposite is true and online news readers tend to favor more conscious prioritizations when taking cues from others, there might be room for website architects to equip news platforms with appropriate affordances in order to promote formation of higher quality public agendas. Using the PCRG portal 2018 data, I address this question empirically in the following chapter.
CHAPTER III. TESTING DYNAMIC AND STATIC NEWS PORTAL APPROACHES

Do logics of prioritization matter? Comparative effects of two types of user agenda cues in a dynamic news portal

Initial analyses of the 2018 PCRG portal data revealed that both media agenda and user agenda, cued by the means of prioritization of certain problems in the main portal newsfeed and sidebar, were effective in moving users’ issue priorities. In addition, researchers manipulated the interface feature that was meant to convey the perception of user agenda – portal sidebar – so that it highlighted two different mechanisms underlying story selection by users. This manipulation was informed by the notion that thoughtful design of online news environments could be used to promote socially desirable behavior among information consumers (e. g. Garrett and Resnick 2011).

In one experimental condition, the Trending sidebar featured the most popular stories from last two days, based on the sheer number of headline clicks made by all portal users. Respondents who were assigned to this condition saw the label “Trending” on top of the sidebar, under which there was an explanatory note that read, “The most clicked-on headlines from the past 2 days.” Such popularity indicator is a common operationalization of a “bandwagon” cue that scholars of communication successfully used across numerous studies of the effects of collaborative filtering in online contexts (Knobloch-Westerwick et al. 2005; Sundar et al. 2008; Yang 2016), as well as an affordance that is frequently found in real-life digital media environments. This mode of presentation implied that many portal users found the highlighted stories worth reading in-depth after seeing the headline in the newsfeed.

The idea behind the Recommended sidebar was to communicate a somewhat different selection process. Half of study participants were instructed that they could recommend any article in the portal to others as an important one to read by clicking an upvote button next to the headline. These recommendations powered selection of stories featured in the
Recommended sidebar that was marked by a note that read, “Stories recommended as important.” In order to make the treatment more realistic, only the users who themselves had access to the vote button could be assigned to the Recommended sidebar condition. This interface feature was designed to highlight the fact that stories that appear in the sidebar were selected as a result of other readers’ conscious prioritizations.

In a dual-process model of agenda setting developed and validated by Pingree and Stoycheff (2013), the effortful, central-route process is called agenda reasoning and consists of thoughtful internalization of the reasons why certain issues are more important than others based on exposure to media coverage. On the heuristic end, the low-effort process is called agenda cueing and entails acceptance of other gatekeepers’ agendas as proxies for what is important to society. This peripheral route is mediated by gatekeeping trust – a belief that the gatekeeper has already performed the cognitive work of prioritizing the truly important problems (Pingree and Stoycheff 2013). According to this framework, individuals who believe that social importance is the primary determinant of the amount of attention that news media afford to particular topics, and who are also unwilling to perform the taxing work of agenda reasoning, are more susceptible to agenda cues coming from media. It is therefore reasonable to expect that an affordance explicitly pointing to the fact that some gatekeeping actor (in this case – other portal users) has already taken the cognitive effort to evaluate issues’ relative importance, can enhance some users’ susceptibility to agenda cues. Hence the research question:

RQ1: Will a user importance cue elicit different agenda-setting effects than a user interest cue in the news portal sidebar?

Prior agenda cueing research provides ample evidence for the key role of gatekeeping trust in predicting the likelihood of news agenda translating into users’ own issue importance judgements. Given the variety of gatekeepers that curate news portal feeds, the optimal
research strategy would be to measure individuals’ pre-exposure levels of gatekeeping trust for each gatekeeper separately. Specifically, in the experiment where both news agenda and user agenda are manipulated, respondents’ gatekeeping trust for both news media and “other users” should be measured. PCRG portal in 2018 only included a measure of general gatekeeping trust, understood as the belief that news media prioritize the most important social issue in their coverage. However, there are strong reasons to test this construct as a potential moderator in the context of examining the differences between importance and interest user agenda cues as well. Firstly, it is possible that levels of gatekeeping trust that the same individual ascribes to different gatekeepers share significant variance, reflecting the person’s more general views of the information environment or the lack of distinct attitudes toward various gatekeepers. Under this scenario, general gatekeeping trust can be treated as a proxy for trust in other users to prioritize socially important issues. Secondly, some respondents may not be paying sufficient attention to the cues attributing curation to the sidebar to other users, and think of the agenda emphasized in the sidebar as news agenda. In this case, general gatekeeping trust remains theoretically relevant. I therefore pose the following research question:

RQ2: Will gatekeeping trust moderate differences in agenda-setting effects of an interest user cue and importance user cue in the news portal sidebar?

Methods

This study uses a 2 (Sidebar format: Trending / Recommended) X 2 (Sidebar issue: Racism over guns / Guns over racism) drawn from the larger 2018 portal experiment. For statistical analyses, all other factors were included into the models I estimated: news agenda either emphasizing Trump-Russia scandal coverage over education and immigration in the main newsfeed, or emphasizing education and immigration over Trump-Russia; presence or absence of editorials defending impartiality of journalists and career civil servants; presence
or absence of vote button next to story headlines; presence or absence of an increased share of headlines from the respondent’s partisan-aligned news sources.

As detailed in the section above, the sidebar format manipulation was enacted by altering both the label on top of the sidebar and the algorithm whereby headlines were featured in it. Trending sidebar included most-clicked stories, while Recommended sidebar displayed those which were most frequently upvoted by users in the vote button condition. Boosting one problem over another in the sidebar entailed doubling the user-driven effect – i.e. presenting a story on guns that was clicked on or recommended five times as if it was clicked on or recommended ten times – while barring all the stories on the competing issue from the sidebar entirely (however, these stories could still be seen in the main feed). Users could only see stories’ relative rankings in the sidebar but not the numbers of clicks or upvotes.

For twelve days in May 2018, the portal was automatically filled with timely news stories sourced from Google News using RSS queries. Articles on relevant topics were identified using keywords and then manually approved by researchers for publication in the newsfeeds associated with respective experimental conditions. Throughout the study period, a total of 3189 stories appeared in the portal.

A convenience sample of U.S.-based adults (final N=1391) was recruited via Amazon’s crowdsourcing platform. The sample was 54.9% female, with an average age of 39 years (SD = 12.28). Seventy-seven percent identified as Caucasian, 7.4% as African American, 7.1% as Asian, 6.0% as Hispanic. More than 42% had a four-year college degree. Politically, 26.0% of participants identified as Republican, 47.8% as Democrat, 22.8% as Independent. During the period of the study, an average participant encountered 493 headlines in the portal newsfeed and clicked on 55 of them to read the full story. Participants
were paid $1 for taking the pre-test survey, $1 for the post-test survey, and either $1 or $3 for using the portal, based on the amount of time spent with it.

Coding of the main outcome variable followed the ranked most important problem method used by Pingree and Stoycheff (2013). In the post-test, participants were asked an open-ended question: “What do you think are the most important problems facing the nation? Please list them in order of importance, starting with the most important problem.” Three trained coders calculated the number of issues each respondent mentioned, as well as the rank of each experimental issue in these open-ended responses. On all coded items, reliability was acceptable, with Krippendorf alpha exceeding 0.70. Problem importance scores were calculated by dividing its reverse rank by the total number of issues mentioned, such that the problem that was not mentioned would get a score of 0, a problem mentioned second on a list of five would get a score of 0.4, and a problem mentioned first would always receive a score of 1. Responses that contained mentions of gun violence, gun control, gun rights, and the Second Amendment were coded as “guns;” those mentioning racism, racial inequality, racial prejudice, racial profiling, racial discrimination, Black Lives Matter, or race-police relations were coded as “racism.”

Pre-test measures of experimental issues’ importance were used in all statistical analyses as covariates in order to adequately capture change in perceived importance and eliminate the concern of differential attrition across treatment conditions. Closed-ended items, measured on an 11-point Likert-type importance scale ranging from 0 to 10, were scattered throughout a larger battery of issues to avoid sensitizing respondents to particular problems. The items used in this study were “Police mistreatment of minorities” (M= 6.83; SD= 2.87) for racism and “Gun control / gun rights” (M= 7.26; SD= 2.66) for guns.

The measure of gatekeeping trust was also adopted from Pingree and Stoycheff (2013) and combined the following five items: “News outlets choose which stories to cover
by carefully deciding which issues or problems are the most important in society,” “When deciding how much time to spend covering each issue, reporters and editors are thinking mostly about how important each issue is in society,” “When the news gives some topic a lot of coverage, it means they’ve decided it’s a really important issue in society,” “The top stories in a TV newscast are usually about whatever issues the editors think are the most serious, urgent or widespread in society,” “You can trust that when there are problems in society that really are urgent and important, the news will make a big deal out of them.”

Responses were measured on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). For the statistical analyses, a dummy version of the variable was created by splitting it at the median value.

Results

Research question 1 asked whether importance user cues and popularity user cues would produce different effects on users’ perceived importance of the issue emphasized in the portal sidebar. To answer this question, I conducted a series of analyses of covariance (ANCOVAs) entering all experimental factors plus a dichotomized pre-test measure of gatekeeping trust as independent variables, and both focal issues’ pre-test importance scores as covariates. In the main model, I used the combined measure of perceived importance of guns relative to racism, calculated as a difference between these two problems’ importance scores, as an outcome variable. I then tested the influence of the same set of factors on each problem’s importance score separately.

The test answering RQ1 in all three models is the interaction between the sidebar format (Trending/Recommended) and sidebar-boosted issue (Racism/Guns) factors. The main ANCOVA model with guns importance minus racism importance as the outcome explained a significant amount of variance in the dependent variable, adjusted $R^2 = 0.031$. However, the analysis revealed no significant main effect for sidebar format, $F (1, 1309) =$
0.379, \ p = 0.538, \ \text{partial} \ \eta^2 = 0.000, \ \text{suggesting that, quite expectedly, the difference in the user cue type alone did not influence respondents’ relative issue importance judgements. More importantly, interaction between sidebar format and sidebar issue was also not significant, } F (1, 1309) = 0.000, \ p = 0.99, \ \text{partial} \ \eta^2 = 0.000, \ \text{indicating that the differences in combined importance scores that users reported in boosted racism condition (Importance cue (M = 0.036, SE = 0.024) and interest cue (M = 0.021, SE = 0.023)) were nearly identical to those reported by users in boosted guns condition (Importance cue (M = 0.093, SE = 0.024) and interest cue (M = 0.078, SE = 0.024)). The effect of user agenda delivered by the portal sidebar manipulation did not differ whether the sidebar featured trending or recommended stories.}

The test for RQ2, which asked if the potential difference in the effect of importance and interest cues is moderated by gatekeeping trust, is a three-way interaction between sidebar format, sidebar-boosted issue, and the dichotomized pre-test gatekeeping trust measure. In the main ANCOVA model, this interaction was not significant, \ F (2, 1309) = 0.516, \ p = 0.597, \ \text{partial} \ \eta^2 = 0.001, \ \text{indicating no mediating effect of gatekeeping trust.}

Follow-up analyses examining the effects of user cue type on respondents’ perceptions of focal problems’ importance separately mirror the pattern observed in the main ANCOVA. A similar model with importance of guns as an outcome and pre-test importance of guns as a covariate explained more than 5 percent of variance in the dependent variable, adjusted \ R^2 = 0.054. There was no significant main effect for the type of user cue, \ F (1, 1353) = 0.156, \ p = 0.693, \ \text{partial} \ \eta^2 = 0.000. The interaction between sidebar format and sidebar issue was not significant, either, \ F (1, 1353) = 0.693, \ p = 0.405, \ \text{partial} \ \eta^2 = 0.001, \ \text{indicating that the effects of two different types of user agenda cue were indistinguishable. Similarly, the analysis revealed no significant three-way interaction between sidebar format, sidebar issue, and dichotomized gatekeeping trust, } F (2, 1353) = 1.240, \ p = 0.290, \ \text{partial} \ \eta^2 = 0.002.
The equivalent ANCOVA model with importance of racism as an outcome, $R^2 = 0.073$, yielded similar negative results: no significant main effect for the type of sidebar cue, $F (1, 1323) = 0.224$, $p = 0.636$, partial $\eta^2 = 0.000$; no significant two-way interaction between sidebar format and sidebar issue, $F (1, 1323) = 0.612$, $p = 0.434$, partial $\eta^2 = 0.000$; and no significant three-way interaction involving dichotomized pre-test gatekeeping trust, $F (2, 1353) = 0.475$, $p = 0.622$, partial $\eta^2 = 0.001$.

**Discussion**

Study 1 put to test the expectation that user-sourced agenda cues could have varying effects if they implied different logics of curation: bandwagon-style, headline click-based interest or a deliberate recommendation of the news as important to read. It also examined whether such discrepancy was different across two levels of gatekeeping trust. Both answers came back negative. There was virtually no difference between the agenda-setting effects of interest and importance user cues on both the combined importance score that captured the difference between the emphasized and deemphasized problem, and on individual issues’ importance scores taken separately. This was true for both low and high-gatekeeping trust individuals.

For several reasons, however, these analyses should not be interpreted as a definitive negative test of the potential differences between the two logics of user curation and their ability to exert distinct effects on respondents’ issue priorities. The observed null results could be due to certain shortcomings in the study design and operationalization of treatments rather than the true lack of difference between the agenda-setting capacities of user interest and user importance cues. Perhaps the biggest weakness of the present operationalization is that the two versions of portal sidebar differed not only in terms of the label specifying the logic of selection, but in terms of story selection algorithm as well. Effectively, this means that in the 2018 portal we lumped together the logic of sidebar prioritization and, quite
possibly, the actual selection of featured headlines that users saw. Consequently, the presence or absence of the effect difference between the two conditions could occur due to either the label indicating the mechanism of selection, the actual content of the sidebar, or some combination of both. The presence of an additional affordance in the form of vote button could also present a confounding factor, altering user experience of those in the Recommended sidebar condition. All in all, these limitations of the present study call for a cleaner test of two user cue types’ potentially differential effects. An experimental design manipulating only the label while holding the content of the feed constant is one possible solution.

With regard to the moderating effect of gatekeeping trust, the null results can be explained by the fact that the construct used in the analysis was not specific to the gatekeeper responsible for the sidebar. While the items in the gatekeeping trust battery asked about the news media’s perceived propensity to prioritize the most important societal problems in their coverage, the sidebar featured stories highlighted by the aggregated behavior of other portal users. Future examinations of the possible moderating role of gatekeeping trust in the agenda-setting processes in news portal context should include gatekeeper-specific measures.

Finally, the design of the 2018 PCRG portal set apart two focal gatekeepers that are central to this study at large – news media and other users – by assigning them to curate different sections of the portal: the main newsfeed and portal sidebar. This layout closely resembles the structure of many real-life news aggregators with a chronological or algorithmically curated main feed complemented by various interface elements used to visually separate specific featured news items. As such, this structure appears optimal for a realistic news aggregating platform that participants are asked to use as their main news source for several days. On the downside, using separate feeds for different gatekeeping
agents precludes us from examining their agenda-setting power comparatively, which is a key line of investigation in this study.

Combined, all these considerations call for using a methodological approach somewhat different from the one that PCRG portals relied on. Advancing our understanding of how curated flows of online information influence formation of public issue priorities requires a research design that would isolate agenda source cues and curation mechanism cues while keeping the agenda itself constant. The next section reports the design and findings of a pilot study that I conducted to test one of the possible variations of such approach.

**A test of screenshot-based stimulus format**

This section details the logic behind an alternative experimental design that utilizes a series of static news portal screenshots as a stimulus. Additionally, it reports the results of a small-sample pilot study using this approach to test the agenda-setting effects of various interface cues. While this underpowered experiment should not be expected to provide meaningful empirical results advancing the agenda-setting theory, it can serve as a test of whether the screenshot-based method is suitable to be applied on a larger scale to address the questions of the broader study.

A dynamic news portal constantly updated with real news headlines is an experimental tool that offers massive validity gains when examining a wide range of attitudinal and behavioral outcomes, yet it is suboptimal for isolating the effects of distinct interface cues by the means of maintaining full control over the selection of headlines that users get exposed to. The mechanism of the PCRG portal feed is such that researchers are confined to the selection of real stories available at the time of the experiment on Google News, enacting agenda treatments by categorizing available news items by topic to boost or suppress availability of certain problems’ coverage. With regard to maximizing control of the
treatment content, using a static interface that features a pre-selected set of news articles appears a better solution. The tradeoff in this case would be the impossibility to maintain longitudinal character of exposure and realistic dynamics of news consumption, taking us back to single-shot, forced exposure experimental format. Nevertheless, the static interface approach can be a profitable way to complement the findings from the dynamic portal because it can assess outcomes that the more realistic longitudinal design is less suited to address.

The solution I devised is based on exposing users to simulated screenshots of a news portal feed. In order to increase the amount of experimental treatment delivered to study participants and thus enhance the chances of eliciting the hypothesized effects, the procedure consists of having users browse through several screenshots at a time. In order to maintain a degree of treatment realism, the interface layout should resemble those of real-life news aggregating platforms, and headlines visible in the feed should be real, recent and relevant to the current mainstream news agenda. Additional validity could be achieved by either credibly simulating an interface of some real news platform, or by telling users that they are beta-testing an interface of a real news site currently under development. Headlines in the portal feed can be both clickable, taking users to actual full news articles hosted elsewhere, or non-clickable, depending on the particular research questions. Because my focus is on the effects of coverage availability and interface cues rather than contents of the coverage, in this study all experiments using portal screenshots approach have non-clickable headlines. In order to boost users’ attention to the headlines and credibly explain the substance of their “testing” contribution, all experiments feature a distractor task, which asks respondents to highlight the headlines that they would likely click on if it was a real, live news portal.

To test the novel approach, I ran a pilot study utilizing a small student sample in November 2018. The interface that I presented to participants as a series of screenshots was
purported to be of a news portal under development. The interface consisted of the main feed with six news headlines and a sidebar with four headlines (see Figure 3). Participants were asked to look at three portal screenshots and indicate the headlines that they would click on, in addition to taking a post-test with demographic and media-related questions. The agenda-setting treatment was delivered via the sidebar, where headlines on the emphasized issue appeared in prominent positions in all three screenshots, while coverage of the deemphasized issue was absent. The main hypothesis that this study addressed was whether this treatment could influence users’ perceptions of relative problem importance.

H1: Emphasizing an issue in portal sidebar will increase its perceived importance relative to the deemphasized issue.
In addition, I manipulated the type of an interface cue conveying the agency behind sidebar curation. In particular, one of the cues was similar to the user-driven popularity cue from the PCRG portal and followed the “bandwagon” logic, presenting the featured stories as the most-clicked by other users. Another condition, in contrast, presented the “authority” cue, attributing sidebar curation to people in the position of specialized knowledge: the portal’s editorial team (Sundar et al. 2009). The third condition contained no gatekeeper-related cue, as it was implied that the articles that appear in the sidebar are simply the most recent headlines. This design allowed me to test whether different gatekeepers exerted varying agenda-setting effects, comparing them between each other and against the no-cue baseline.
RQ1: Will the effects predicted in RQ1 differ between bandwagon agenda cue, authority agenda cue, and no-cue condition?

Methods

This study employs a 2 (Sidebar issue: Healthcare / Education) X 3 (Sidebar cue: Bandwagon / Authority / No-cue control) between-subjects factorial design. Portal screenshots were manipulated to alternatively feature stories on either healthcare or education in the sidebar while leaving all stories on the competing issue out.

Between the two levels of this factor, headlines on the focal issue occupied exactly the same positions in every screenshot, and the rest of the sidebar stories and all of the main feed remained exactly the same. I the first screenshot, headlines on the focal issue appeared as #2 and #4; in the second screenshot, as #4; in the third screenshot, as #3 and #4. Overall, 5 out of 12 sidebar headlines across three screenshots represented the experimental issue in each of the two conditions.

The cue factor was enacted by altering labels on top of the sidebar, as well as instructions that users received prior to exposure. In the bandwagon cue condition, the label on top of the sidebar read “Trending,” and users were instructed prior to seeing the screenshots that the sidebar was populated with headlines that readers clicked on the most. In the authority cue condition, the sidebar label read “Recommended,” and the pre-exposure instructions specified that sidebar-featured articles were recommended by the portal’s editorial team. In the control condition, portal sidebar was labelled as “Latest,” with an explanatory note stating that the sidebar contains the most recent stories.

All the headlines featured in the portal newsfeed and the sidebar were of real, timely stories, drawn from Google News portal several days before the experiment was conducted. Each story was represented by a headline, thumbnail picture, and a source label. In order to alleviate the possible effects of participants’ partisanship and ideology, stories originating
from sources that could be considered ideologically slanted (Fox News, MSNBC, etc.) were not be featured. Politically polarizing topics, such as the Mueller investigation and other controversies surrounding the Trump administration, were also omitted for the same reason. The remaining topics included a mix of substantive issues, e.g. international affairs, economy, technology, national security, trade, and some “softer,” general-interest content. The headlines included in the feed were chosen in a way that they clearly indicated the topic, so that it will be sufficient to look at the headline to infer its subject matter.

Issue importance scores were calculated in a similar fashion to the PCRG portal-based agenda-setting studies. In the post-test, users were asked an open-ended question, “In your opinion, what are some of the most important issues facing the nation today?” The responses thus obtained were manually coded to indicate whether either healthcare or education were mentioned. If the issue was not mentioned at all, a respondent received a score of 0 on this issue. If the issue was mentioned among others, all the issues in the response were inversely numbered (e.g. the last issue on the list was assigned a score of 1, the second-to-last a score of 2, etc.), following which I calculated the problem’s importance score by dividing its inverse rank by the overall number of issues mentioned.

A convenience sample (N=77) of students from a Mass Communication department at a large Southern university was recruited for the experiment. The sample was 89% female, with age ranging from 18 to 29 years, and a median age of 21. The sample was 78% Caucasian, 13% African American, and 5% Hispanic. Equal shares of respondents identified as Republican and Democrat – 39% each, with 18% of independents. The experiment was severely underpowered to detect the differences between all six cells: preliminary power analysis indicated that in order to indicate moderate-sized effects (r = 0.20) with 95% confidence, the sample should have exceeded N = 500.
In terms of respondents’ distribution across experimental conditions, the random assignment procedure yielded an almost perfect distribution between the two agenda-setting cells: 39 respondents in the healthcare condition and 38 in the education condition. However, with regard to interface cues, randomizer failed to produce cells of equal size: while 33 respondents ended up in the Latest sidebar cue condition and 33 in the Trending condition, only 14 respondents, or 18% of the overall sample, were assigned to see the Recommended sidebar cue.

**Results**

Hypothesis 1 predicted that exposure to portal screenshots will have an effect on users’ perceived relative importance of the issues emphasized and deemphasized in the portal sidebar. In order to estimate this difference, I ran an ANOVA model with the sidebar issue and cue type as factors. As an outcome variable, I used a composite importance difference score, calculated as perceived importance of healthcare minus perceived importance of education.

The analysis revealed a significant main effect for prioritizing a problem in portal sidebar, $F (1, 71) = 10.883, p = 0.002$, partial $\eta^2 = 0.133$. In the condition where healthcare was emphasized respondents reported significantly higher importance score for that problem compared to education ($M = 0.23$, $SE = 0.06$), while in the condition with an emphasis of education the importance score’s difference was negative ($M = -0.08$, $SE = 0.07$), suggesting that on average respondents in this condition ascribed higher importance scores to education compared to healthcare. Thus, the data supported the notion that the screenshot-based manipulation was efficient in influencing users’ issue priorities.

The test for RQ1, which asked whether the portal’s agenda-setting effect differed across the levels of the cue type factor, is the interaction between the emphasized problem and cue type in the same ANOVA model. This interaction was not significant, $F (2, 71) =$
0.218, \( p = 0.804 \), partial \( \eta^2 = 0.006 \), indicating that the perceived relative importance of emphasized and deemphasized problems did not depend on the type of the interface cue.

**Discussion**

The fundamental question that this pilot study sought to address is whether an agenda-setting manipulation based on exposing users to a simulated static news portal interface could influence their issue priorities. In this regard, the results are reassuring: having consecutively browsed through three newsfeed screenshots, in the post-test study participants exhibited significantly different perceptions of relative importance of two experimental issues. Granted, the study employed a rather crude manipulation, combined with a post-test-only design that rendered capturing potentially important moderating constructs impossible, and an extremely demographically homogenous sample. This precluded examination of individual differences in susceptibility to the agenda-setting manipulation, or making inferences about the mechanisms through which the effect occurs. Caution is also warranted in interpreting the lack of differential effects between various types of interface cues. Should these differences exist outside of the experimental setting, they are likely subtle and modest in size, meaning that discovering them despite all the limitations of the present study (most notably, the lack of power) is unrealistic.

Still, the potency of the static portal’s effect on respondents’ issue priorities suggests that this methodological approach is fit to be utilized in agenda-setting studies on a larger scale. The success of the pilot paves the way for designing methodologically similar experimental studies relying on better quality interfaces and more nuanced manipulations, larger and more diverse samples, and a wider range of nuanced survey tools allowing researchers to measure relevant individual attitudes prior to exposure. The following chapter reports the results of an agenda cueing experiment that does all these things at once.
CHAPTER IV. AGENDA CUEING IN AGGREGATED NEWSFEEDS: A NEWS PORTAL EXPERIMENT

Introduction

Agenda setting, understood as the news media’s capacity to influence the public’s judgements about relative importance of societal issues, is an effect that has been consistently replicated across numerous empirical studies (McCombs and Shaw 1972; Iyengar and Kinder 1987; Wanta and Ghanem 2007). In theory, this function of mass media is crucial for a stable democratic system that relies on citizens’ shared understanding of the most pressing problems facing the society. The news is at least capable of directing public attention to the issues of utmost importance, mustering public support for specific courses of action to resolve them, and thus enabling policy action (Baumgartner and Jones 2010). However, the reality of agenda-setting is far from an ideal rational process of prioritizing problems. On the supply side, a host of factors underlying formation of news agendas – economic incentives, news values such as timeliness and drama, interests of political elites, and diverging news preferences of journalists and the public, to name a few – result in mass media prioritizing issues on grounds other than importance to society (Bennett 1990; Boczkowski and Mitchelstein 2015; Cook 1998; Price & Tewksbury 1997; Wu 2016). On the consumer side, news users can misinterpret signals coming from the media – for example, by taking mere frequency of coverage as a sign of issue importance – and thus form agendas that are reactive and unstable (Pingree et al. 2013).

This study, informed by the dual-process theories of agenda-setting, investigates psychological mechanisms that underlie the formation of people’s issue importance judgements in digital news environments. My particular focus is on how these mechanisms play out in the context of aggregated online newsfeeds, where interface cues exert immense influence on the ways in which users make sense of the information they encounter. Some scholars have argued that thoughtful design choices made by the architects of news websites
could steer audiences toward more responsible and socially beneficial modes of media consumption (Munson and Resnick 2010; Garrett and Resnick 2011). In the spirit of these calls, one of the goals of this investigation is to test the effects of several formats of newsfeed interface cues that could be instrumental in promoting more meaningful agenda-setting practices among the audiences of online news.

**Agenda cueing and dual-process agenda setting**

As some scholars called for increasing the explanatory capacity of agenda-setting theory (Kosicki 1993), the more recent wave of investigations addressed psychological mechanisms underlying issue importance judgements. The early stages of agenda-setting research were marked by either little attention to such mechanisms, or a presumption, grounded in psychological theories of knowledge activation (e.g. Higgins 1996), that cognitive accessibility is what drives agenda-setting effects (Iyengar 1990; Price and Tewksbury 1997). The role of accessibility heuristic as a key causal ingredient of agenda setting effects came into question when evidence emerged that such effects are moderated by media trust (Tsfati 2003), which suggests that at least some individuals do not just blurt out the most cognitively accessible problem in response to the survey question, but choose to accept influence in a conscious cognitive process (Pingree & Stoycheff, 2013). Furthermore, the findings of a study where cognitive accessibility of relevant objects was actually measured did not support the expectation that it mediates agenda-setting effects (Miller 2007).

Eventually the agenda-setting scholarship departed from viewing cognitive accessibility as the main driving force behind the formation of citizens’ issue priority judgements. Most of recent theoretical developments in the field are informed by the notion that the nature of the process is dual, as it may occur through both central and peripheral routes. Takeshita (2006) argued that the definition of issue salience includes two components:
cognitive accessibility and perceived importance, and therefore the responses to the most
important issue questions cannot be comprehensively explained by accessibility alone. His
dual-process model, however, retains accessibility as one of the two psychological paths
through which the effect occurs: the automatic, low-effort process that he calls “pseudo”
agenda setting. It operates alongside the “genuine” agenda setting, construed as an effortful
process that involves central processing of considerations related to problem importance.

Bulkow and colleagues (2012) developed a dual-process model of agenda setting
centered on individuals’ personal involvement with the issue. They used a realistic, custom-
made experimental news website filled with both real news articles and made up stories on an
experimental issue, which was available to respondents over a period of several days and
allowed them to freely choose which stories to read and how much. The researchers tested the
expectation that users process stories on personally relevant topics more centrally and stories
on less relevant ones more peripherally. They found that higher involvement with an issue
predicted increased number of articles read and more persistent effects, while lower
involvement was associated with diminished attention to the articles on the topic and higher
susceptibility to presentation cues such as frequency and prominence of coverage. The effects
of such peripheral processing on respondents’ judgements of issue importance were found to
be less stable over time.

Importantly, as Pingree and Stoycheff (2013) highlight, the nature of the heuristic
process that Bulkow and colleagues’ model describes is fundamentally different from the
accessibility heuristic. The psychological mechanism of issue importance judgements
formation that Takeshita (2006) explicates is based on the idea that individuals construct such
judgements at the moment of responding to the survey question, by the means of sampling
issues most readily available from memory. In contrast, since personal involvement with the
issue is the key moderator in Bulkow et al.’s model, it implies that the underlying process
unfolds incrementally, with each story the respondent sees updating the stored attitudes toward the issue in question. In this model, the survey response is a product of an individual retrieving these pre-stored importance judgements on a number of issues and comparing them to one another.

Based on these theoretical advancements, Raymond Pingree and Elizabeth Stoycheff have developed a dual-process agenda-setting model where the systematic process is labelled agenda reasoning and heuristic process, agenda cueing (Pingree and Stoycheff 2013). Agenda reasoning represents a cognitively effortful, central-route learning process whereby individuals get exposed to the actual content of media coverage and discover substantive reasons for why a certain issue is important. On the peripheral side, agenda cueing, similar to the models that feature accessibility heuristic, is grounded in the notion that the answer to the most important problem survey question is constructed at the moment of giving a response. The crucial difference from the accessibility-based processes here is that, rather than simply resorting to whatever issue comes to mind first, respondents use what they recall to be on the news agenda as a substitute for their own issue importance judgements. In other words, respondents who are unwilling to perform the cognitively taxing task of agenda reasoning for themselves can outsource this work to news professionals, provided they believe that news agenda reflects journalists’ conscious judgements about what’s important. This route does not presume active engagement with news content: news users can pick up agenda cues from superficial characteristics of news coverage such as frequency or salience, which can be inferred from simply scrolling through the newsfeed. In fact, news agenda cueing does not require exposure to news at all because all that is required is a belief that recent news has emphasized certain topics. As an experimental stimulus, Pingree and Stoycheff used a report summarizing the top problems from recent news coverage to manipulate the perceived news agenda by altering how often each problem was said to have been covered, without altering
the number of times each problem was mentioned in the stimulus report. Thus, this study isolated pure agenda cueing effects from cognitive accessibility effects as well as from exposure to agenda reasons present in actual coverage. They found sizeable effects of the perceived news agenda on respondents’ perceptions of relative issue importance.

Stoycheff, Pingree, Peifer, and Sui (2018) extended this line of research into the realm of social media. They tested the effects of perceived social media agenda, cued using a Twitter summary report, alongside the effects of the news media agenda. The researchers found evidence that telling respondents that an issue is frequently discussed on Twitter increases their likelihood to name it as important, even though the effect is smaller compared to a similar cue attributed to news media. The existence of these effects and the difference in their magnitude suggests that news users’ issue importance judgements are malleable to agenda cues coming from a variety of gatekeepers, and that the perceived agency behind the cues does matter. This warrants further experimental exploration of agenda cueing effects in digital multi-source media environments, where news platforms’ interface features and affordances allow for cueing diverse logics of content prioritization and presentation.

**The role of gatekeeping trust in agenda cueing**

The agenda cueing hypothesis has roots in previous work that found evidence for the moderating role of media trust in agenda-setting processes (Tsfati 2003; Miller and Krosnick 2000). This line of reasoning maintains that the more individuals trust the media, the more likely they are to accept their agenda as a reflection of the issues important to the nation. Pingree and Stoycheff (2013) put to test an intuition that it is not the generic media trust that underlies this relationship, but a more specialized set of beliefs, which they labelled gatekeeping trust. This construct captures the extent to which media consumers believe that news organizations tend to prioritize the issues that are important to the society in their
coverage, and that these prioritizations reflect news professionals’ importance-based judgements rather than more pragmatic considerations.

Since agenda cueing entails delegating one’s own judgement of relative issue importance to the media, some level of trust in their ability to accurately prioritize societal problems is essential. Gatekeeping trust reflects the belief that the gatekeeper has invested appropriate cognitive effort into figuring out which issues are of utmost importance. Individuals with higher levels of this belief are more influenced by agenda cues from news media. This attitude, however, is different from general media trust: it is possible to view mass media positively while being skeptical of their ability to always prioritize the most important issues of the day. In Pingree and Stoycheff’s experiment, the measure of gatekeeping trust was validated as distinct, as it moderated agenda cueing effects and general media trust did not.

Gatekeeping trust is a media literacy construct that is rooted in a simplistic understanding of newsmaking practices. It can be viewed as a form of miscommunication between the press and the audiences, such that individuals high in gatekeeping trust uncritically believe that the coverage is a result of deliberate prioritizations and ignore other news values that inform news agenda, such as sensationalism, drama, novelty, and timeliness of the stories (Price & Tewskbury, 1997). As such, high levels of gatekeeping trust in citizens are normatively undesirable, since it can contribute to people equating problems that are salient in the news with problems that are important for society. Scholars have found that exposure to and expression of criticism of media gatekeeping practices can decrease gatekeeping trust without diminishing the more beneficial and desirable general trust in mainstream media (Pingree et al. 2013).

In today’s digital news environments, news media professionals are not the only actors to exercise gatekeeping power. Aggregated newsfeeds where a significant portion of
the digital audience encounters media content are also curated by members of their social networks, users who comment and “like” articles on news websites, and recommendation algorithms (Thorson and Wells 2016). The amount of attention and salience that these gatekeepers afford to certain topics could also indicate a coherent agenda and serve as a perceived manifestation of collective judgements of issue importance. If users of online news are susceptible to these bandwagon agenda cues, their effects should be moderated by the belief that the source of the cue has done the requisite cognitive work. Following this logic, Stoycheff and colleagues (2018) introduced the concept of social media gatekeeping trust in a study that examined the effects of both media agenda and user agenda (inferred from Twitter) on respondents’ perceptions of relative issue importance. Similarly to gatekeeping trust, this new construct was intended to capture the extent to which individuals believe that social media users prioritize issues based on their importance.

Stoycheff et al.’s experiment failed to produce evidence for the moderating role of social media gatekeeping trust for any of the six issues examined. Yet, the authors admitted that this result should be considered as highly tentative, since the way they operationalized the concept was just one of many possible options. The lack of the moderating effect could also be specific to the social network they used and the format of the stimulus: a Twitter coverage summary report. In this study, I use a modified version of social gatekeeping trust that taps into the respondents’ perception of the “wisdom of the crowd” as the source of the cue. It is also not confined to a single platform or social media at large, but instead relates to all users of online news as a gatekeeping authority.

**Studying agenda cueing in multi-source media environments**

In both agenda cueing experimental studies to date, researchers relied on a highly specific treatment: reports summarizing previous week’s news coverage and presenting either the percentage of stories dedicated to each issue (Pingree and Stoycheff 2013) or rank-
ordered list of the most covered topics, with the issues purported to have dominated the media agenda coming first (Stoycheff et al. 2018). The logic here was to cleanly isolate the effects of pure agenda cues by exposing respondents to a distilled representation of media agenda and not the news content itself. Had the actual news been available to participants, they could have engaged in systematic processing of agenda reasons, thus diluting the effect of agenda cueing manipulation. Such stimuli provide a robust operationalization of the concept of agenda cue, and for the purposes of experimentally testing agenda cueing hypotheses it is irrelevant whether perceptions of media agenda are derived from exposure to media or a summary report. On the other hand, experimental studies of agenda cueing can also advance the theory by addressing the question of whether particular formats of media exposure stimuli are successful in creating perceptions of news agenda in line with researchers’ expectations.

In other words, the real-life process of agenda cueing involves individuals forming their own perceptions of what media agenda is, before they can use this perception to inform their response to the most important issues question. A holistic summary of coverage provided by a reputable research organization, fashioned with exact numbers or percentages, could have a much more powerful effect than any of the individuals’ own perceptions derived directly from reading or watching the news. Therefore, for experimental findings regarding the effects of agenda cues to have a better generalizability, we have to demonstrate that agenda cue uptake occurs in a situation of users’ exposure to a realistic news environment, while minimizing exposure to agenda reasons. The word “minimizing” here is no coincidence: in real-life news setting, users’ complete isolation from substantive agenda reasons is impossible. Even if we imagine an individual who habitually scrolls through a newsfeed and never clicks on stories to read, there will still be glimpses of agenda reasons present in headlines and blurbs. In sum, advancement of agenda cueing theory requires more
externally valid tests of the actual forms that real agenda cues take, while aiming to minimize agenda reasons instead of completely eliminating them.

**The role of interface cues**

Scholars of computer-mediated communication have long pointed out that technological affordances visible on online interfaces can affect users’ expectations and perceptions of content (Sundar et al. 2015). germane to the field of media effects research, S. Shyam Sundar and colleagues have developed a theoretical framework that summarizes their work on psychological effects of digital media’s technological affordances. Abbreviated as the MAIN model, short for Modality, Agency, Interactivity, and Navigability, it describes four major categories of affordances that activate heuristics relevant to information processing in online media environments (Sundar 2008). The MAIN model conceptualizes cues as website interface features that activate these cognitive shortcuts (Bellur & Sundar 2014).

The affordances most relevant for the study of agenda cueing fall under the agency category. These are the interface features that convey other people’s collective behaviors toward or perceptions of media content. Arguably the most dominant in online news environments are what Sundar and Nass (2001) labelled bandwagon cues – the ones that indicate attitudes of other users toward the content in question: comments, views, likes, upvotes and downvotes. One news-related example of a bandwagon cue are counters against individual news stories marking them as having been read or endorsed the most by other users – a format frequently found in both socially and algorithmically curated newsfeeds. These metrics tend to be seen as convincing because they imply a quantitative, automated measurement of user behavior not informed by any individual human gatekeeper’s decisions (Thorson 2008). Past research suggests that bandwagon cues present in digital interface exert powerful effects on both attitudinal and behavioral outcomes, such as message
persuasiveness, purchase intention, click likelihood, and selective exposure to the endorsed content (Yang 2016; Messing and Westwood 2014; Sundar 2008; Sundar et al. 2008; Xu 2013; Knobloch-Westerwick et al. 2005). All these studies, however, explore outcomes other than perceived issue importance.

A distinct form of agency cue is the authority cue. While bandwagon cues indicate that multiple unidentified users – presumably, peers perceived as “other people like me” – have in some way endorsed the content in question, authority cues attribute the endorsement to certain individuals or groups that are in a better position than an average person to make the judgement, for example a topic expert or an official authority (Sundar 2008). Although empirical evidence of bandwagon and authority cues’ comparative effects remains scant, in some contexts unrelated to online news these two types of cues were shown to affect user attitudes and behaviors differently. One study of cues embedded in the interface of an e-commerce website examined the effects of peer versus expert endorsement on respondents’ purchase intention, and found that bandwagon cues are generally more powerful. However, when those are inconsistent, authority cues are capable of influencing user attitudes (Sundar, Xu, and Oeldorf-Hirsch 2009). In the aggregated newsfeed setting where agenda cues can come from both traditional gatekeepers and other users, it is possible that agenda-setting effects could vary depending on whether such cues activate bandwagon or authority heuristics.

In the context of agenda cueing model, it does matter whose exactly is the perceived agenda that respondents rely on as they think of their own issue prioritization. The evidence of the moderating role of gatekeeping trust indirectly suggests that individuals who are prone to take agenda cues are aware of where the cues come from. Based on the theoretical advancements in computer-mediated communication literature, we can reasonably expect that respective portal interface features will allow users to differentiate between various entities
behind the newsfeed’s curation, and update their issue importance judgements according to the level of gatekeeping trust attributed to each of these actors. In order to test this expectation, in this study agenda cues presented in a news portal feed will be attributed to either news media or peer users.

**Logics of recommendation**

Agenda cueing is a process whereby individuals delegate the work of making social issue importance judgments to the party that has presumably already performed this cognitive effort. Given almost limitless opportunities for website designers to create features that convey any kind of additional information about the content present in the feed, it is possible to envision an interface element explicitly indicating that certain news stories were selected on the grounds of their perceived importance. Indeed, news portals often include areas designated for featured stories, marked as “trending” or “most popular.” A feasible version of this affordance could be the one presenting some stories as specifically recommended as important, i.e. highlighting that the selection of news items is the result of someone’s conscious prioritization. If such a feature proves to be more effective in influencing individuals’ problem importance perceptions than a non-specific agenda cue, there might be room for strategically designing news website interfaces so as to facilitate news consumers forming more robust and reasoned issue agendas. This effect would be achieved by members of the public following explicit agenda cues originating from other news media consumers who are willing to make and share circumspect issue importance judgements.

The following hypotheses summarize the expectations generated from the review above:

**H1:** The presence of a problem in agenda cues a) from news media; b) other users, in the form of a popularity indicator; c) other users, in a form of explicit recommendation, increases problem importance judgments.
H2: The presence of agenda cues from news professionals will increase problem importance judgments more among those with higher news gatekeeping trust.

H3: The presence of agenda cues from a) other users, in the form of a popularity indicator; b) other users, in a form of explicit recommendation will increase problem importance judgments more among those with higher social gatekeeping trust.

Methods

The study was designed as a fully factorial experiment with a pre-test and post-test. Its design has been preregistered with the Center for Open Science (Bryanov 2019). Respondents were randomly assigned to one of the experimental conditions produced by a combination of three factors: 2 (Social issue presence: Abortion / Drugs) X 2 (Technology issue prominence: AI regulation / Cybersecurity) X 3 (Source of agenda cue: Top stories / Most viewed / Recommended). The first factor was designed to test the combined effects of what Stoycheff and colleagues refer to as cue presence – whether or not the issue was covered in the news at all – and cue prominence, or the salience of the problem’s coverage (Stoycheff et al. 2018). In the Abortion condition, the newsfeed contained an increased number of headlines on this topic, which occupied some of the top spots in the feed, and no headlines related to drug-related problems. Conversely, in the Drugs condition, same top spots were occupied by headlines of stories on topics such as drug abuse and the government’s response to the opioid epidemic, with no stories on abortion present in the feed.

The second factor was designed to diminish the role of the cognitive accessibility component in the hypothesized agenda-setting mechanism. This stimulus was meant to influence the respondents’ relative perception of the importance of two issues – AI regulation and cybersecurity – however, the logic of presentation was different. Rather than alternating the combined presence and salience of the two experimental issues between two problem conditions, I only manipulated their relative salience. For example, in the condition where AI
regulation was emphasized, headlines covering this problem were ranked higher in the feed than cybersecurity-related headlines; in Cybersecurity condition, the rankings of the stories on the two problems were reversed. Throughout the three screenshots combined, both topics we covered by the same number of headlines.

Finally, in order to attribute curation of the newsfeed to particular gatekeepers and highlight the logic of story prioritization, the third experimental factor manipulated the label on top of the newsfeed. This salient interface feature came in three variations. In the Top Stories label condition, the gatekeeping authority is ascribed to Google News’ ranking algorithm, which also reflects aggregated decisions of mainstream media professionals. Because Google is a dominant player in online information search market, the Top Stories section of its news service should serve as a reliable representation of what the news media are talking about generally. Other two conditions were designed to represent two different versions of the news portal users’ aggregated judgements. The Most viewed label merely signified users’ heightened interest to the stories featured, while the Recommended label was supposed to convey users’ conscious effort to prioritize the coverage of most important problems. To strengthen this effect, this label was supplemented by an explanatory note underneath it, which read, “Recommended by portal users as important.”

The present study aims to improve on external validity of past agenda cueing investigations by using a novel experimental stimulus that consists of a series of static screenshots of a simulated Google News feed. Because it resembles a snapshot of a real-life newsfeed with story headlines, source titles, and attendant presentation cues, such stimulus can convey agenda cues associated with both prominence and frequency of coverage, as well as who is behind the feed’s curation and the mechanism of prioritization. At the same time, the headlines are not clickable and they do not allow respondents to proceed to reading the actual articles to learn agenda reasons that they likely contain. Agenda cues in this study are
operationalized as a combination of two elements: frequency of coverage and prominence of the topic’s appearance in the newsfeed.

To render the experimental treatment as realistic as possible, I used screenshots that closely resembled the newsfeed of Google News, one of the most highly trafficked news aggregators globally. The logo on top of every page, as well as the general interface layout, major interface elements and fonts were identical to those used by Google News at the time of the experiment. The treatment came in the form of three screenshots purported to represent a curated selection of the previous week’s mainstream news stories. Each participant saw three screenshots from three different recent days that each delivered the same social issue presence manipulation, followed by another three screenshots from three recent days that each delivered the same technology issue prominence manipulation. The articles were real news pieces drawn from Google News’ Top Stories section, and represented a diverse variety of topics. In all three screenshots, stories about the experimental problem were featured in prominent positions multiple times (for details, see the Procedure section below). Between the two emphasized problem conditions, the exact positions in the newsfeed where the stories about the experimental issue were featured were identical, and the rest of the stories were the same – for example, if respondents in the Abortion condition saw a screenshot where stories about abortion occupied spots #1 and #4 out of 8, those in the Drugs condition saw the same screenshot, except positions #1 and #4 featured stories on drugs. In each social problem condition, there were no stories on the other experimental issue featured anywhere in the feed. Therefore, while this operationalization of the cue was designed to maximize the agenda-setting effect, it is unable to completely eliminate the cognitive accessibility explanation of the observed differences between the two issues.

The second set of the experimental stimuli came right after and presented participants with three screenshots of what was purported to be the technology section of Google News
portal. The emphasized problems were either AI regulation or cybersecurity; the experimental treatment was enacted by displaying the headlines about the emphasized problems higher in the newsfeed relatively to the deemphasized issue. For each respondent, the source of agenda cue was consistent throughout both issue factors, i.e. if a participant was exposed to the “Most viewed” social problems newsfeed, the technology newsfeed was also labelled as “Most viewed.” Figures 4 and 5 present sample screenshots of the general and technology newsfeeds, respectively, as they were seen by study participants.

Emphasized issues and broader news context

The study was fielded early in the week of February 17, 2020, and featured real news stories from the previous week that appeared as top stories in Google News. The week of February 10 saw the contenders for Democratic presidential nomination face off in the New Hampshire primaries, days after Pete Buttigieg’s upset victory in Iowa caucuses and the subsequent Eighth Democratic primary debate. President Trump’s impeachment trial had concluded on February 5 with an acquittal, and analyses and reactions to this event still dominated the news cycle. Reports of the rapid spread of COVID-19 were becoming a consistent feature of daily news, although the amount of coverage dedicated to the spread of the virus was still modest compared to that several weeks later, when the World Health Organization qualified the outbreak as a pandemic, and dozens of confirmed cases were registered in mainland United States.
Figure 4: Screenshot 1 out of 3 in social problems newsfeed, abortion emphasized over drugs, “Top Stories” agenda cue.
Out of 24 stories that each participant saw across three screenshots of the general national newsfeed, six were experimentally manipulated and the other 18 remained the same regardless of the experimental condition. These filler headlines were assembled to realistically represent the real news agenda of the week. Of these 18, four stories were related to the scandals and controversies surrounding the Trump administration (mainly reactions to the conclusion of the impeachment trial); three covered the administration’s routine policy work such as presidential budget proposal; three were about Democratic presidential candidates, their performance in primary season debates; two stories were on crime. Coronavirus, social security, climate, FDA policies, housing, and interstate relations were represented by one story each. Filler articles were drawn from twelve sources: CNN (3); Fox News (2); The Washington Post (2); CNBC (2); The Hill, USA Today, The Verge, NBC News, AOL, Wall Street Journal, and NPR (all – 1). Stories on experimental problems came from The New York Times (2 on abortion, 1 on drugs); The Hill (1 on abortion, 1 on drugs), The Washington Post (1 on drugs); PBS (1 on abortion); National Review (1 on abortion); Gallup (1 on abortion); NPR (1 on drugs); The New Yorker (1 on drugs), and Vox (1 on drugs).

Abortion and drugs were selected as relatively conspicuous problems consistently present in the political and media discourse of the United States, yet the ones not in the top tier of most frequently mentioned problems and not in the news spotlight during the time of fielding the study. Both of these issues were mentioned as the most important problem facing the nation by about 1 percent of respondents in a January 2020 Gallup poll. To put this in perspective, healthcare and immigration were both mentioned by 6 percent of respondents in the same poll, while unemployment, crime, and terrorism got 1 percent each (Gallup 2020). During the week of February 10 when the stories were collected, no story on either abortion or drugs had appeared in the researcher’s Google News top stories section – however, this
Figure 5: Screenshot 2 out of 3 in technology newsfeed, AI regulation emphasized over cybersecurity, “Recommended” agenda cue.
could be different for other users due to Google’s algorithmic personalization of news output. The articles on the experimentally manipulated problems were found using keyword search embedded in Google News interface. The time period from which they were drawn extended beyond the week of February 10 to include all of January 2020 and the first week of February due to scarcity of stories suitable for inclusion into the stimulus.

The second part of the experimental treatment, which aimed to test the effects of differential ranking of emphasized and deemphasized problems’ coverage, simulated a technology-specific newsfeed. Since I expected the effect of this treatment to be significantly weaker than of the coverage of the two problems alternately, I chose to test it in the context of a specialized field that is more obscure to the general public than major national news. This way, I expected to limit the influence of both preexisting problem importance judgements (because fewer people would have opinions on technology-specific issues) and political or ideological valence of certain problem phrasings, frames, and source labels inevitably present in the general national newsfeed.

The original Technology section of Google News portal tends to contain few stories on socially problematic implications of digital technology. The coverage is mainly focused on topics such as novel gadget releases, updates of popular software, and news of the gaming industry. Against the background of filler headlines sourced from this regular coverage, the stories on experimental topics – AI regulation and cybersecurity – should stand out conspicuously. Five headlines on each of these topics were scattered throughout three screenshots of the technology feed, with the difference between experimental conditions manifested in the relative ranking of these stories (for details, see Procedure section). Stories on experimental issues were pulled from a mix of mainstream and more obscure, tech-specific news outlets. I used Google News’ search bar to discover articles using relevant

Procedure

At the start of the experiment, participants responded to a battery of demographic questions and series of items measuring the two versions of gatekeeping trust (general and social) and general media trust, as detailed in the Measures section below. In addition, they were presented with a closed-ended list of twenty national problems and prompted to indicate on a 1-7 scale how important they thought each problem was. Respondents were then randomly assigned to one of the experimental conditions enacted by the study design: 2 (Social issue presence: Abortion / Drugs) X 2 (Technology issue prominence: AI regulation / Cybersecurity) X 3 (Source of agenda cue: Top stories / Most viewed / Recommended), and were directed to respective sequences of screenshots.

On top of each newsfeed screenshot in the experimental treatment, respondents saw a prompt reading: “Screenshot of Google News from [date]. Please click on headlines to mark which stories you would have chosen to read. You can choose up to 5 headlines.” The task was designed as both a distractor from the main study goal of estimating the agenda-setting effects and a means of focusing users’ attention on the newsfeed content. Each participant saw three screenshots, with a label on top of each reading either “Top Stories” or “Most viewed” or “Recommended,” consistent between three consecutive screenshots in each cue source condition. The annotation in smaller print under the Recommended label read, “Recommended by portal users as important.” Every screenshot contained 8 news items, each represented by a headline, thumbnail illustration, and source label.
Three screenshots of the social problems newsfeed came first. In screenshot 1 of every experimental condition, stories on either abortion or drugs were seen as #1 and #4; in screenshot 2, treatment stories occupied spots #2, #5, and #6; in screenshot 3, a treatment news item was in spot #3. Such placement combined prominence and frequency of the emphasized topics’ coverage in the aggregated newsfeed. Respondents then proceeded to the three screenshots of the Google News’ technology section. In screenshot 1 of technology newsfeed, the emphasized issue was #2 and #3 and deemphasized issue was #6; in screenshot 2, the emphasized issue was #1 and #4 and deemphasized issue was #5 and #8; in screenshot 3, the emphasized issue was #3 and deemphasized issue was #4 and #7. Thus, each of the two experimental problems was represented by five headlines scattered throughout three screenshots.

Having gone through all six screenshots and indicated the headlines that they would likely click on, respondents were directed to the screens with the open-ended, social issue importance question and then the technology-specific issue importance question. The next screen contained four manipulation check batteries, where for each experimental problem (Abortion, Drugs, AI regulation, Cybersecurity) participants were asked about 1) perceived frequency of the issue’s coverage by news media; 2) perceived importance that news media ascribed to the problem; 3) perceived amount of attention that internet users gave to the problem; 4) perceived importance that internet users ascribed to the problem. On the next screen, participants responded to a question asking to indicate what label was on top of their screenshots. They were then directed to the debriefing page that clarified the purpose of the experiment and explained that the content of the screenshots was experimentally manipulated.

Sample
In order to address the questions at the center of this study, I employed a convenience sample (initial N=1026) of US-based respondents, recruited through Amazon Mechanical Turk crowdsourcing platform. MTurk has become a common venue for social scientists to recruit study participants, since it is relatively affordable, offers greater demographic diversity compared to college undergraduate samples, and outperforms many other internet-based recruitment tools on this measure (Buhrmester, Kwang, and Gosling 2011). With the rise of online recruitment tools and particularly widespread adoption of Mechanical Turk, some scholars voiced concerns regarding quality of the data thus obtained, citing participants’ possible lack of attention and diminished trust in online experimental stimuli. However, an empirical investigation of the MTurk-sourced data showed that levels of attention that respondents on the platform exhibit is comparable to that of other popular commercial samples, and the levels of trust that they report are similar to participants’ in laboratory experiments (Thomas and Clifford 2017).

Participants were paid $1 for participating in the study. The sample recruited for this study was 57 percent male, with a median age of 33. Three-quarters of the sample identified as Caucasian (76 percent), 11 percent as African American, 7 percent as Asian, and 5 percent as Hispanic. Politically, the sample was skewed Democratic: 48 percent reported thinking of themselves as Democrats, 30 percent as Republicans, and 21 percent as independents. In terms of education level, 9 percent reported being high school graduates or below, 21 percent reported having attended college, 56 percent had a 4-year college degree, and 14 percent had professional or advanced degree. Participants indicated a high self-reported news interest, based on a two-item scale consisting pf the following items: “How interested are you in politics?” ranging from “Not at all” to “Very interested” and “How much attention do you pay to news and current events?” ranging from “Very little” to “A lot” on a 1 to 7 scale (M = 5.26, SD = 1.34). Before proceeding to hypothesis testing, I performed randomization checks
to make sure that random assignment resulted in even distribution of these demographic characteristics across all levels of experimental factors.

Thirty-seven cases were removed for excessively patterned responses to consecutive items (Patterned response counter, n.d.). Another concern related to the quality of data is that, even though participation was programmatically restricted to US-based respondents, some MTurk users could use VPN tools to enroll in the study from other locations that are widely represented on the platform. Having this in mind, I excluded cases where responses to open-ended issue importance questions indicated poor command of English language or were incoherent. Since perceived issue importance was the key outcome of interest, I also dropped cases where respondents had not provided any substantive answers to these questions. After I performed these manipulations, another 200 cases were dismissed, and the final sample used in statistical tests was reduced to N=790.

**Measures**

Dependent variable: perceived issue importance

Two variations of the main outcome of interest were measured using an open-ended question. In order to register the effects of exposure to the general newsfeed, I used the following formulation borrowed from Stoycheff and colleagues (2018): “What do you think are the most important problems facing the nation? Please list them in order of importance, starting with the most important problem.” Since the second part of the experimental treatment entailed exposure to the specialized technology-focused newsfeed, the second version of the question addressed this area specifically: “What do you think are the most important problems in the field of technology right now? Please list them in order of importance, starting with the most important problem.”

The issue importance scores were then calculated by dividing the issue’s reverse response position by the total number of issues mentioned. As a result, regardless of the total
number of issues mentioned, the problem listed first received the importance score of 1; if a respondent did not mention the issue at all, its importance score was 0; if it was mentioned halfway through the list of several problems, it was coded as 0.50. For instance, if drugs was last in a list of three problems, its importance score would be 0.33; if “opioid crisis” was listed last in a list of five problems, drugs would receive a score of 0.20.

Two trained coders first produced the counts of problems mentioned in each social and technology issue response, then generated rankings for each of the four focal issues. Reliability was acceptable on all four items, with Krippendorf’s alpha ranging from 0.72 to 0.91.

Gatekeeping and social gatekeeping trust

Gatekeeping trust (Cronbach’s $\alpha=0.89$, $\text{M}=4.45$, $\text{SD}=1.38$) was adopted from Pingree and Stoycheff (2013). The following items were included: “News outlets choose which stories to cover by carefully deciding which issues or problems are the most important in society,” “When deciding how much time to spend covering each issue, reporters and editors are thinking mostly about how important each issue is in society,” “When the news gives some topic a lot of coverage, it means they’ve decided it’s a really important issue in society,” “The top stories in a TV newscast are usually about whatever issues the editors think are the most serious, urgent or widespread in society,” and “You can trust that when there are problems in society that really are urgent and important, the news will make a big deal out of them.” Responses were measured on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). For the purposes of statistical analysis, a dichotomized gatekeeping trust variable was created, where 0 stood for values below the median of 4.60 and 1 represented the values above the median.

Social gatekeeping trust (Cronbach’s $\alpha=0.84$, $\text{M}=4.76$, $\text{SD}=1.24$) followed a similar logic that Stoycheff et al. (2018) used in adapting the original gatekeeping trust measure to
the context of social media. However, in contrast to their social media gatekeeping trust construct, social gatekeeping trust measured in this study is not limited to users of platforms such as Twitter or Facebook, but rather is intended to tap into the perceptions of the gatekeeping capacity of online news users at large. Whereas manifestation of user agenda on Twitter is posting about the issue (hence the items like “You can trust that when there is a problem in society that is really urgent and important, people will post a lot about it on social media”), a more general notion that is also applicable to news portal setting is simply paying attention to the issue. Therefore, the social gatekeeping scale used in this study included the following items: “You can trust that when there is a problem in society that is really urgent and important, people will pay a great deal of attention to it online”; “Even when you don’t follow politics and current events, you can trust that others will bring important issues to your attention on the internet”; “When a lot of people read and talk about a political issue online, it means people think that issue is more important than other issues”; and “When people read news on the internet, the problem to which they pay the most attention is usually the one that they think is really serious, urgent, or widespread in society.” Responses were measured on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). A dichotomized version of this scale was constructed using its median of 4.75.

General media trust

As in previous agenda cueing studies, I included a measure of general media trust (Cronbach’s α=0.95, M=4.11, SD=1.62) to test whether the effects of gatekeeping trust are distinct from those of the more general trust in mainstream media. Following Pingree et al. (2013), a general media trust scale adapted from Tsfati (2010) was used, including the following items: “In general, mainstream news outlets are fair,” “In general, mainstream news outlets are accurate,” “In general, mainstream news outlets are unbiased,” “In general, mainstream news outlets tell the whole story,” and “In general, mainstream news outlets can
be trusted.” Similarly to gatekeeping trust and social gatekeeping trust, responses were measured on a 7-point scale ranging from 1 (strongly disagree) to 7 (strongly agree). A dichotomized version of this scale was constructed using its median of 4.20.

Closed-ended issue importance (pre-test)

In order to enable within-subject comparisons between before and after exposure to the treatment, as well as to have a covariate in models estimating agenda-setting effects, in the pre-test I presented respondents with a closed-ended list of 20 problems drawn from the Gallup December 2019 Most Important Problem Survey, shown in a randomized order, and asked them to rate the importance of each issue on a 1 to 7 scale ranging from “Not very important” to “Extremely important.” (Gallup, Inc. n.d.). Abortion and drugs, the problems used in the experimental treatment, were included among other issues: Gap between rich and poor; Unemployment/jobs; Federal debt; Taxes; Wage issues; Foreign trade; Corporate corruption; Poor leadership; Immigration; Healthcare; Poverty/Homelessness; Environment/Climate change; Race relations/Racism; Guns/Gun control; Abortion; Education; Drugs; Crime; Welfare; Terrorism.

Theorized mediators: Perceived agendas

Since the agenda cueing hypothesis predicts that some news consumers will base their problem importance judgements on what they think the media prioritized in their coverage, it is critical to establish that the experimental manipulation of various issues’ visibility in portal newsfeed resulted in perceptions of gatekeepers’ heightened attention to these issues. I measured perceptions related to news media agenda and user agenda separately. In the post-test, respondents were asked to answer a battery of four questions about the two pairs of problems that were emphasized in the general and technology-specific newsfeeds. For each issue, participants were asked to indicate their level of agreement with the following statements: “News media covered [experimental issue] a lot recently;” “Journalists think that
[experimental issue] is an important issue in society;” “People on the internet have been paying a lot of attention to [experimental issue] lately;” “People on the internet think that [experimental issue] is an important issue in society.”

**Results**

Descriptive statistics and mean differences of outcome variables

I begin with describing the data on the main outcome of interest: perception of the importance of the emphasized and deemphasized experimental issues. On average, respondents perceived abortion as a somewhat more important problem (M = 0.052, SD = 0.191) than drugs (M = 0.039, SD = 0.162), when averaging across all experimental conditions. More importantly, when the importance scores were recoded as the importance of the issue emphasized or deemphasized by the treatment for a particular respondent, the difference between mean importance score of the emphasized issues (M = 0.065, SD = 0.211) and deemphasized issues (M = 0.025, SD = 0.132) was in the expected direction and significant using a paired-samples t-test, $t(789) = 4.54, p < 0.001$. This preliminary analysis suggests that the experimental treatment succeeded in eliciting higher perceived importance of the problems emphasized in the main portal newsfeed. It has to be noted that this is not yet a hypothesis test, since it does not differentiate between different cue sources and merely captures the averaged effect of exposure to the portal across all cue source conditions.

The treatment, however, has only had an effect on a modest share of participants. Analysis of the outcome variables’ frequency distributions demonstrated that only 10.8 percent of users mentioned their emphasized issue when responding to the most important problem question, compared to 4.6 percent who mentioned their deemphasized issue. Therefore, the average values of the emphasized and deemphasized problems’ importance scores, as well as the difference between these two scores (M = 0.040, SD = 0.245) – the main outcome variable used in subsequent statistical analyses – are rather small.
A look at the distribution of perceived importance scores of technology-related issues presents a different picture. The average importance scores of both emphasized (M = 0.263, SD = 0.411) and deemphasized issues (M = 0.248; SD = 0.396) is much greater than the scores of general problems facing the nation. Although the difference between the means of these two variables is in the expected direction, a paired-samples t-test suggests that these two means are statistically indistinguishable, t (787) = 0.72, p > 0.05, indicating that manipulation of relative ranking of the two problems’ coverage in the newsfeed did not result in a statistically significant agenda-setting effect altogether. However, availability of both issues in the news portal, coupled with lack of coverage of other societally important problems related to technology, resulted in a much higher rate of recall of both experimental problems by respondents: when listing the most important issues related to technology, more than 31.7 percent of participants mentioned the emphasized problem, while the deemphasized problem was mentioned by over 31 percent of participants. Across all experimental conditions, cybersecurity has been assigned a much higher importance score (M = 0.325, SD = 0.436) than artificial intelligence regulation (M = 0.186, SD = 0.356).

Testing differential effects of cues

I now proceed to testing the main hypotheses of the study. In order to address H1, H2, and RQ1, I estimated an ANCOVA model with all experimental factors (Social issue presence; Technology issue prominence; Source of agenda cue) entered as main effects, cue source factor’s interactions with hypothesized moderators (dichotomized gatekeeping trust and dichotomized social gatekeeping trust), general media trust as a covariate, and the agenda-setting effect (difference between importance scores of the emphasized and deemphasized issues) as an outcome variable. The initial model yielded a one-way significant main effect for source of agenda cue, F (2, 778) = 2.89, one-tailed p = 0.028, partial η² = 0.007, such that participants in the Top stories condition reported higher agenda-setting effect
scores ($M = 0.071$, $SE = 0.015$) than their peers in both user-sourced conditions: Most viewed ($M = 0.027$, $SE = 0.016$) and Recommended ($M = 0.26; SE = 0.016$). Because the mean outcomes for both user cue conditions were nearly identical, and there was no difference between these two cue types across levels of gatekeeping trust and social gatekeeping trust, I collapsed them together to produce a two-level cue source factor (Top stories/User-sourced), which I used in all subsequent statistical analyses.

A similar ANCOVA model specified to include a two-level cue source variable yielded a significant main effect for that factor, $F (1, 781) = 5.75, p = 0.017$, partial $\eta^2 = 0.007$, such that respondents in the news agenda (Top stories) cue condition reported significantly higher agenda-setting scores ($M = 0.071$, $SE = 0.015$) than did respondents in the combined user-sourced cue condition ($M = 0.027$, $SE = 0.011$). Controlling for general media trust, an interaction between the cue source factor and dichotomized measure of gatekeeping trust was not significant, $F (1, 781) = 2.67$, one-tailed $p = 0.051$, partial $\eta^2 = 0.003$. However, post-hoc comparisons revealed that inside this interaction one group was significantly different from others: users in the news cue condition who are high in gatekeeping trust. While agenda-setting scores reported by participants in the user-sourced cue condition who were both low ($M = 0.019$, $SE = 0.016$) and high in gatekeeping trust ($M = 0.034$, $SE = 0.020$), as well as by participants in the news cue condition who were low in gatekeeping trust ($M = 0.029$, $SE = 0.021$) were statistically indistinguishable from each other, users who were exposed to the “Top news” feed and scored high in gatekeeping trust were significantly more likely than any other group to name the emphasized issue as important ($M = 0.112$, $SE = 0.024$). These differences are visualized in Figure 6.
Figure 6: Interaction between Cue source and Gatekeeping trust on agenda setting effect.

The data did not support my expectation that social gatekeeping trust moderates the agenda cueing effects for users in user-sourced cue condition, as the interaction between cue source and dichotomized social gatekeeping trust was not significant, $F (1, 781) = 0.375$, $p = 0.54$, partial $\eta^2 = 0.000$.

I then conducted a similar set of analyses on the perceived importance of technology-related issues as the dependent variable. An ANCOVA model with all experimental factors (Social issue presence; Technology issue prominence; Source of agenda cue, two-level) as main effects, cue source factor’s interactions with hypothesized moderators (dichotomized gatekeeping trust and dichotomized social gatekeeping trust), and general media trust as a covariate yielded two significant main effects. A non-experimental effect was revealed for the type of emphasized technology issue, such that in the AI regulation condition average importance score ($M = -0.112$, $SE = 0.030$) of the highlighted problem was significantly
smaller than in cybersecurity condition ($M = 0.170$, $SE = 0.30$). The negative sign in front of the first group’s mean indicates that even when stories related to AI regulation were ranked higher in the newsfeed than stories on cybersecurity issues, study participants still reported higher average importance scores of the latter problem. The analysis yielded a significant main effect of the cue source, $F(1, 779) = 4.23$, $p < 0.05$, partial $\eta^2 = 0.005$. Respondents in the news cue condition reported considerably higher scores of the emphasized problem’s importance ($M = 0.074$, $SE = 0.035$) than did their peers in the user-sourced cue condition ($M = -0.016$, $SE = 0.027$). The analysis also revealed that neither gatekeeping trust nor social gatekeeping trust moderated the effects of source cue factor. The interaction between the two-level cue source factor and the dichotomized gatekeeping trust was not significant, $F(1, 779) = 0.015$, $p = 0.90$, partial $\eta^2 = 0.000$, and so was the interaction between cue source and the dichotomized social gatekeeping trust, $F(1, 779) = 0.092$, $p = 0.76$, partial $\eta^2 = 0.000$.

Mediation analyses

The agenda cueing hypothesis posits that some news consumers consciously accept what they perceive to be prominently covered by the news media as an indicator of what journalists and editors deem to be important, and, by extension, what is actually important to society. This study incorporated post-test survey items that allow me to test this mechanism empirically. As a first step in this analysis, I used responses to questions designed to gauge participants’ perceptions of how much attention either news media or people online have recently paid to experimental issues, and how important these gatekeepers think these problems are. First, I investigated whether the main treatment – emphasizing a problem in the portal newsfeed – had an effect on these four potential mediators in the agenda cueing process. I only looked at the problems featured in the general newsfeed, since the experimental treatment failed to elicit hypothesized agenda-setting effect in the technology feed altogether. For that end, I ran two sets of ANOVA models, separately for each
emphasized issue, abortion and drugs. Each model had one of the four outcomes of interest as a dependent variable, with all experimental factors entered as independent variables. The results are summarized in Table 1 below.

Table 1: Factorial Between-Subjects Models

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>df, residual</th>
<th>F</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived recent coverage of abortion by media</td>
<td>1, 985</td>
<td>38.03</td>
<td>***</td>
<td>0.037</td>
</tr>
<tr>
<td>Perceived importance of abortion among journalists</td>
<td>1, 983</td>
<td>19.33</td>
<td>***</td>
<td>0.019</td>
</tr>
<tr>
<td>Perceived attention recently paid to abortion by people on the internet</td>
<td>1, 982</td>
<td>18.85</td>
<td>***</td>
<td>0.019</td>
</tr>
<tr>
<td>Perceived importance of abortion among people on the internet</td>
<td>1, 984</td>
<td>22.52</td>
<td>***</td>
<td>0.022</td>
</tr>
<tr>
<td>Perceived recent coverage of drugs by media</td>
<td>1, 983</td>
<td>15.95</td>
<td>***</td>
<td>0.016</td>
</tr>
<tr>
<td>Perceived importance of drugs among journalists</td>
<td>1, 983</td>
<td>12.45</td>
<td>***</td>
<td>0.013</td>
</tr>
<tr>
<td>Perceived attention recently paid to drugs by people on the internet</td>
<td>1, 985</td>
<td>20.62</td>
<td>***</td>
<td>0.021</td>
</tr>
<tr>
<td>Perceived importance of abortion among people on the internet</td>
<td>1, 980</td>
<td>15.03</td>
<td>***</td>
<td>0.015</td>
</tr>
</tbody>
</table>

Note: p < .05 *, p < .01 **, p < .001***

As it is visible from the table, in both issue conditions the experimental treatment significantly increased the means of all four outcomes: perceptions of the amount of attention allocated to the problem by news media and social gatekeepers, as well as perceived importance ascribed to the problem by these gatekeepers.
Next, I tested whether cues meant to represent the agenda of either mainstream news or portal users succeeded in influencing respondents’ perceptions of these gatekeepers’ respective agendas. If these manipulations achieved the intended specialized effects, the news media cue should be more effective in influencing respondents’ perceptions of the emphasized issue’s heightened media coverage and importance assigned to it by journalists, while the user-sourced cue should produce a greater effect on participants’ perceptions of the amount of online audiences’ attention to the issue, as well as of how important internet users think the problem is. To estimate these effects, I conducted a series of ANOVAs with perceived media/user agendas and perceived media/user-ascribed emphasized issue importance, and all experimental factors as independent variables, including two-level cue source factor. The results of these tests are summarized in Table 2.

Table 2: Factorial Between-Subjects Models

<table>
<thead>
<tr>
<th>Theorized effective cue source</th>
<th>Dependent Variable</th>
<th>df, residual</th>
<th>F</th>
<th>p</th>
<th>partial η²</th>
</tr>
</thead>
<tbody>
<tr>
<td>News</td>
<td>Perceived recent coverage of emphasized issue by media</td>
<td>1, 985</td>
<td>0.00</td>
<td>-</td>
<td>.000</td>
</tr>
<tr>
<td>News</td>
<td>Perceived importance of emphasized issue among journalists</td>
<td>1, 984</td>
<td>3.21</td>
<td>*</td>
<td>.003</td>
</tr>
<tr>
<td>Users</td>
<td>Perceived attention recently paid to emphasized issue by people on the internet</td>
<td>1, 984</td>
<td>1.02</td>
<td>_</td>
<td>.001</td>
</tr>
<tr>
<td>Users</td>
<td>Perceived importance of emphasized issue among people on the internet</td>
<td>1, 982</td>
<td>2.23</td>
<td>_</td>
<td>.002</td>
</tr>
</tbody>
</table>

Note: p < .05 *, p < .01 **, p < .001***

The analyses revealed that the only potential agenda cueing mediator significantly influenced by its “specialized” cue is the perceived importance that journalists ascribe to the emphasized issue, which saw a significantly greater increase in the news cue condition
compared to user-sourced cue condition. Yet, a more important finding here is the lack of the user-sourced cues’ effect on perceived user agenda. Increased perceptions of the news coverage intensity and journalist-assigned importance are already baked into the experimental treatment enacted by exposure to the news portal aggregating stories from mainstream media. However, the failure of user-sourced cues to produce heightened perceptions of user-related agenda outcomes suggests that the manipulation did not succeed in creating the intended effect. This also could be the reason why the data did not present evidence for the hypothesized moderation of agenda-setting effects by social gatekeeping trust in user-sourced condition. Overall, while emphasizing the problem in the news portal feed produced highly significant effects on perceived media and user agendas, as well as on perceived importance that these gatekeepers ascribe to the emphasized issue, interface cues meant to convey different agencies behind the newsfeed’s curation were only partly successful in producing differential effects on perceived agendas. This was mainly due to the lack of the user-sourced cues’ expected effect on perceived user agenda.

Moderated mediation models

Having established that emphasizing the problem in the portal newsfeed results in a significant increase in both users’ own importance judgements and their perceptions of the gatekeepers’ agendas and importance judgements, I can test the central tenet of the agenda cueing hypothesis: the two-step process whereby the effect of exposure to news on users’ issue importance is mediated by perceived gatekeepers’ agendas and importance judgements. More specifically, the agenda cueing model predicts that the second step of the process, whereby perceptions of gatekeepers’ agenda inform users’ own responses to the most important problem question, is moderated by gatekeeping trust. This conditional process, therefore, can be described as moderated mediation.
To conduct moderated mediation analysis, I relied on the PROCESS macro developed by Hayes, which uses OLS regression-based path analysis to estimate a range of conditional process models. This tool performs bootstrapping analysis, whereby it runs sampling with replacement on the original dataset, creating a large sample from which it calculates confidence intervals for indirect effects of interest. In order for the indirect effect to be significant, its confidence interval must not include zero (Hayes 2018).

I estimated two identical moderated mediation models, separately for the issues of abortion and drugs. In each model, I used the change in perceptions of the target problem’s importance from pre-test to post-test, calculated as a difference in the standardized values of these two measures, as the outcome variable. The dichotomous experimental issue factor (the presence of abortion/drugs agenda cue) was entered as the independent variable, while two potential mediators were tested simultaneously: perceived intensity of the problem’s coverage by news media and perceived importance that news professionals ascribe to the problem. Finally, I included two potential moderators, gatekeeping trust and general media trust, to assess their effect on the path between each potential mediator and the outcome variable, as well as the possibility that they could moderate the direct path from treatment to the outcome. The models did not differentiate between different sources of agenda cues, rather focusing on the general process whereby exposure to the portal resulted in the change of the participants’ issue importance judgements.

The model with the change in perceived importance of abortion as the outcome was significant, \( F (11, 776) = 3.408, p < 0.001 \), and explained 4.6 percent of the overall variance in the dependent variable. Individual effects are visualized in Figure 7. Controlling for mediated effects, a significant direct effect of the treatment on the outcome variable was revealed, \( B = -0.390, t = -4.117, p < 0.001 \), along with significant effects of the treatment on both potential mediators. In the second step of the mediation process, although perceived
media coverage and perceived media importance did not have a direct effect on the outcome variable, the analysis revealed a significant interaction effect between perceived media coverage and gatekeeping trust, 95% confidence interval (CI) = -0.1209 to -0.0029.
Figure 7: Moderated mediation model, outcome variable: Change in perceived importance of abortion.

Note: $p < .05 \,*$, $p < .01 \, **$, $p < .001 \, ***$. Model constructed following a bootstrapping procedure with 10000 iterations.
Overall model: $F (11, 776) = 3.408, p < 0.001, R^2 = 0.046.$
Figure 8: Moderated mediation model, outcome variable: Change in perceived importance of drugs.

Note: p < .05 *, p < .01 **, p < .001 ***. Model constructed following a bootstrapping procedure with 10000 iterations.
Overall model: F (11, 774) = 3.975, p < 0.001, R² = 0.053.
Such effect was not observed in the case of the interaction between perceived media importance and gatekeeping trust, as its 95% confidence interval included zero: CI = -0.0088 to 0.1072. Thus, only perceived media coverage was revealed to be a significant mediator in this process, with gatekeeping trust moderating its effect on the outcome variable. Gatekeeping trust also moderated the direct effect of the experimental treatment on the dependent variable, CI = -0.3703 to -0.0053. Of note, general media trust did not significantly moderate any of the direct or indirect effects in the model, supporting the notion that gatekeeping trust operates separately from the more general construct.

The model with the change in perceived importance of drugs as the outcome is visualized in Figure 8. Overall, the model was significant, F (11, 774) = 3.975, and explained 5.3 percent of variance in the dependent variable. The analysis yielded no significant direct effect of the treatment on the outcome variable, B = 0.127, t = 1.307, p = 0.1916. Although the treatment succeeded in significantly affecting both potential mediators, perceived media coverage and perceived media importance, the expectation that in the second step of the mediation process these variables would predict the change in perceived importance of drugs was not supported by the data. No significant interactions of these potential mediators with either gatekeeping trust or general media trust that theory would lead me to expect were revealed. In fact, the interaction between perceived media importance and gatekeeping trust was significant, CI = -0.1529 to -0.0079, but the direction was the opposite to the hypothesized: it appeared that the increased perception of importance ascribed to drugs by news media predicted a decreased perception of this problem’s importance as gatekeeping trust increased.

A closer look at the data suggested that the reason for this unexpected pattern lies in the discrepancy between high and low-gatekeeping trust users in both experimental problem
conditions. Across the board, participants low in gatekeeping trust increased their perceptions of the drugs issue’s social importance (M = 0.21, SD = 1.36), while those high in gatekeeping trust, on average, decreased their perceived importance of drugs from pre-test to post-test (M = -0.17, SD = 1.29). The experimental treatment was somewhat successful in narrowing this gap: in the condition where drugs was the cued issue, the mean difference between high (M = -0.01, SD = 1.51) and low gatekeeping trust participants (M = 0.17, SD = 1.31) was just 0.18; in the condition where there was no coverage of drugs, this difference was as high as 0.57: (M = -0.32, SD = 1.03) for high-gatekeeping trust users and (M = 0.25, SD = 1.40) for those low in gatekeeping trust. Thus, the overall direction of the trend persisted despite the treatment effect. At the same time, high-gatekeeping trust participants reported higher perceived media importance of the drugs problem (M = 4.87, SD = 1.59) than did their low-gatekeeping trust counterparts (M = 3.67, SD = 1.69), when averaged across the two experimental conditions. As a result, what appears as a significant interaction in the model could be described as the result of high-gatekeeping trust respondents assigning high importance to the drugs issue in both the pre-test and post-test perceived media importance, while failing to mention the problem in their open-ended MIP response often enough compared to low-gatekeeping trust users.
CHAPTER V. DISCUSSION OF FINDINGS AND SOCIETAL IMPLICATIONS

Discussion of study results

This study set out to test the agenda cueing hypothesis in the context of a news aggregating portal, while using a realistic experimental treatment enhancing the external validity of the test. The data supported my expectation that, when the agenda cue is present in the portal newsfeed, users’ perceptions of the cued problem’s importance would increase. Consistent with theory, the treatment also successfully influenced respondents’ perceptions of how often news media cover the problem of interest, as well as of how important news professionals think the problem is to society for both of the cued issues. It supported the notion that agenda cueing is mediated by perceived agenda of gatekeepers, as previous studies theorized (Pingree and Stoycheff 2013). In the case of the emphasized problem of abortion, the analysis revealed both a mediated effect of the treatment on issue importance judgements through perceived media agenda and the direct effect of the treatment that remains there even controlling for the mediated effects. This direct influence can be viewed as being produced by all other agenda-setting processes resulting from news portal exposure other than agenda cueing, including but not confined to cognitive accessibility. This finding is consonant with the understanding of agenda setting as a dual process, a view that had dominated the past two decades of research of its psychological mechanisms.

An alternative version of the agenda cueing treatment was designed to test the effect of the prominence cue, enacted as differential ranking of two issues in the newsfeed. The treatment did not achieve the expected effect, as both of the technology issues received similar importance scores following exposure to the portal, no matter which one has been featured more prominently. It is highly likely that the overall effect of exposure to the technology-specific newsfeed was powerful, as both cybersecurity and AI regulation were mentioned by almost one-third of respondents in the post-test most important problem.
question – compared, for example, to about 10 percent of participants who mentioned their cued social issue. Among the contextual factors that could contribute to this effect are the lack of other problematic stories in the technology feed, as well as generally more obscure nature of this specific news agenda. Overall, however, the assertion of the agenda-setting effect of the technology feed remains speculative, since the study design did not incorporate neither the control condition where one or both technology issues would not be present, nor the pre-test measure of perceived importance of cybersecurity or AI regulation that could be used as a baseline to compare against.

The finding that the prominence cue did not produce the expected effect should not be interpreted as the evidence that differential ranking does not have influence on user perception of problem importance generally. Rather, it is likely that the present operationalization was not successful in creating the impression that the newsfeed was hierarchically organized, and that the higher position on the list of headlines corresponded with the higher priority that the gatekeeper had assigned to a particular article. At the time when the study was fielded, the real Google News main feed did not contain any explicit indicators that the order in which the topics and news stories were presented was determined by the top-down logic. The only edge that the stories presented on top of the feed gained over their lower-ranked counterparts has been higher likelihood for users to encounter them when scrolling down from the top. That said, the experimental newsfeed was organized somewhat differently than the real Google News’ sequence of thematic blocks of headlines from different sources covering the same topic. Rather, it presented a linear sequence of thematically unrelated and visually separate headlines, a format commonly associated with hierarchical ranking. The impression of top-down organization could be further strengthened by an inclusion of an affordance explicitly pointing to it, for example, assigning sequential numbers to headlines similarly to how Yahoo!News’ Trending sidebar is organized. I,
however, opted not to alter the interface that dramatically in order to avoid excessively straining respondents’ credulity. Future studies investigating the effects of stories’ rank order in aggregated newsfeeds should incorporate manipulations that would more explicitly convey the hierarchical character of the feed’s organization.

The central hypothesis of the study was informed by the expectation that users’ perceptions of different gatekeepers behind the newsfeed’s curation can elicit varying agenda-setting effects. The experiment pitted the aggregated mainstream news media, whose agenda prioritizations manifested in the portal’s Top Stories selection, against portal users as the source of agenda cues. The results of empirical analyses supported the hypothesized differential effects of cues coming from different curatorial actors, lending further credence to the idea that the process of agenda cueing entails conscious delegation of problem importance judgements to an authoritative gatekeeper. The finding that the increase in the agenda-setting efficiency of the news agenda cue is primarily driven by users high in gatekeeping trust can also be viewed as evidence in support of the agenda cueing hypothesis, which predicts that this effect is concentrated among those who trust the news media to prioritize the most important issues of the day in their coverage.

Two contextual factors could also be at play to make the newsfeed labelled as Top Stories significantly more efficient in influencing respondents’ problem importance perceptions as a result of exposure to a simulated Google News interface. One is that major news aggregating websites, and Google News in particular, are known to be online spaces that host high-quality journalistic content. Users’ expectations of the kind of information they can encounter on the Google News platform is likely those of the most high-profile news stories of the day, produced by the most reputable publishers and reliably and “objectively” selected by Google’s algorithm. The Top Stories label provides a cue that the content presented in the feed is consistent with these expectations. In contrast, both user-sourced cues
are representative of the mode of curation that is largely peripheral in the context that the experiment is simulating. Secondly, while the Top Stories is a real feature of Google News that users could have encountered previously, the affordances indicating most viewed and recommended headlines have not been featured on this particular website before and therefore might be perceived as unfamiliar. Both of these factors could lead to increased credibility of the Top Stories newsfeed compared to newsfeeds with user-sourced cues, which would in turn make it more likely that users adopt the information presented under the Top Stories label.

My conclusion that mainstream news media has been the most influential gatekeeper in the context of a news portal feed rests on the assumption that users treated Google News’ Top Stories section as a reliable representation of what the news talked about. Google News is a news aggregating service provided by a single most dominant player in the information search industry. As such, it is the entity whose logo is arguably the most suitable to be put on top of an experimental newsfeed that attempts to look like the most reliable representation of the aggregate mainstream news agenda. Still, there remains a possibility that some of the resulting agenda-setting effect could be explained by the attitudes that users have toward the delivery platform rather than the publishers whose content it hosts. Future studies could further advance the theory by incorporating tests to separate the credibility and trust that users associate with either mainstream media or the news aggregating websites’ sponsors (Flanagin and Metzger 2007; Westerwick 2013).

Addressing H1b and H1c, the effects produced by both variations of user-sourced agenda cue were not different from one another, but were significantly smaller than the agenda-setting effect of the media-sourced cue. This does not mean that newsfeeds labelled as user-curated did not have any influence on individuals’ issue importance perceptions – yet, their effect was not discernible from the overall effect of exposure to the portal, and therefore
I cannot claim that the observed process is agenda cueing. As mediation analyses revealed, the user cue manipulation fell short of producing the intended effect: moving participants’ perception of the portal users’ agenda and importance judgements to a greater extent than did the news agenda cue. One possible explanation for this is, again, contextual: users may have not perceived Google News as a platform from where collective behaviors and attitudes of internet users at large could be gauged, even when “bandwagon” interface cues are present. Exactly same newsfeed labels may still be able to produce the expected effect in a more social context, or if the experimental interface is not purported to represent any real news aggregating platform. The same applies to the difference between two distinct logics of content endorsement: most viewed and explicit, importance-based recommendation. While in the present study the effects of these two versions of the treatment on issue importance perceptions were indistinguishable, it is quite possible that the two social cues would produce differential effects when present in a different information environment where social curation is more expected, and users might be more attentive to variations in curatorial logic. Future research should continue investigating the comparative effects of agenda cues coming from same gatekeepers but implying different types of content endorsement.

Another consideration relevant to the observed lack of the effect of user-sourced cues is subtlety of the experimental stimuli within the cue source factor. Just as it is the case in real-life online news consumption, respondents could have easily overlooked the label on top of the newsfeed. Responses to the post-test manipulation check item indicated that only 47% of respondents could correctly recall the label on top of the newsfeed they were exposed to.

Gatekeeping trust emerged as a significant moderator in the agenda cueing process, supporting Hypothesis 2. Respondents who reported higher levels of the belief that news media prioritize the issues most important to society were more susceptible to the news agenda cue, even controlling for general media trust. This finding further supports the notion
that media literacy interventions aimed at reducing citizens’ level of gatekeeping trust are
needed in order to mitigate some individuals’ propensity to uncritically accept media agenda
as a reliable representation of the most important social issues (Pingree et al. 2013). As the
present study illustrates, this logic remains valid even as the bulk of news consumption
migrates to multi-source, digital news environments.

No similar effect was observed in the tests of the role of social gatekeeping trust in
the agenda-setting process driven by user-sourced cues. Yet, this is not the definitive negative
answer to RQ1. The reason why there was no moderation of agenda cueing from portal users
by social gatekeeping trust is not that the construct itself is irrelevant; rather, it is because
there was no separate socially driven agenda cueing process to moderate. Social gatekeeping
trust is still potentially relevant and should be tested in the context of appropriate newsfeeds,
such as Reddit-style news websites with explicit user content ranking affordances or social-
first information spaces like Twitter.

In addition to testing the hypotheses related to differential agenda cueing effects
produced by various gatekeepers, I conducted moderated mediation analyses to model the
process whereby exposure to the experimental newsfeed elicited changes in respondents’
issue importance judgements. Estimated for the issues of abortion and drugs separately, the
models produced different results. While in the case of abortion the observed process
conformed to the expectations derived from agenda cueing hypothesis, in the drugs model
exposure to the experimental stimulus did result in heightened perceptions of media coverage
and media-ascribed importance, yet failed to significantly move respondents’ average
perception of the social importance of drugs. This discrepancy is unsurprising in the light of a
long tradition of research that documented the contingency of agenda setting by news media.
Scholars observed that the media’s ability to influence the public’s perceptions of relative
problem importance depends on a number of both recipient-specific and message-specific
contextual factors, including the problem at hand, the surrounding news agenda, and the baseline perceived importance (Geiß 2019; Walgrave and Van Aelst 2006).

The model with perceived importance of abortion as the outcome presented a picture consistent with the agenda cueing hypothesis. Emphasizing the issue in the news portal feed powerfully influenced users’ perceptions of the amount of coverage of this issue by news media and of the importance that journalists ascribe to it. In the second step of the process, respondents high in gatekeeping trust were significantly more likely than their low-gatekeeping trust peers to take up the cue and list abortion as one of the most important issues facing society. That said, a powerful direct effect that flowed from stimulus exposure to the increase in perceived problem importance indicated that a portion of the overall effect could be explained by mechanisms other than agenda cueing. Particularly, it is highly likely that presence of agenda cues in the portal made the problems thus highlighted more cognitively accessible when participants were asked to indicate the most important social problems shortly after stimulus exposure. In sum, these findings validate the agenda cueing hypothesis but also highlight the multi-faceted nature of agenda setting as a process that can be driven by multiple psychological mechanisms for different individuals even when all aspects of the message are held constant.

Overall, this study demonstrated that agenda cueing does occur in the context of aggregated newsfeeds, as presence of agenda cues in a multi-source newsfeed can increase users’ perceived issue importance. At least some individuals are perceptive to variation in the source of agenda cues, indicating a promising research avenue: investigation of various gatekeepers’ relative effectiveness in setting public agenda. The study also highlighted the importance of contextual variables, suggesting that future investigations should focus on testing agenda cueing effects across a range of online digital platforms.
Implications for society

Out of the vast variety of digital communication platforms where people encounter socially and politically consequential information, I chose to study news portals because of how they tend to consolidate news — first and foremost, high-quality mainstream news — and organize it in structured, logical ways. In a world where both distribution channels and audiences are increasingly fragmented, information systems that fulfil such a rare knowledge-centralizing role for any substantial share of news consumers have a unique capacity to influence people’s collective understanding of the social world.

Aggregators do not simply relay what the multitude of news sources cover and how they cover it, but introduce their own design and algorithmic choices into selection and presentation of this information. Although they might seem minor, the differences that these choices make can accumulate over time and affect crucial aspects of public opinion, including, in no small part, what problems people perceive as the most urgent for political leaders to address. Furthermore, the immense influence of presentation cues goes beyond affecting just the consumers: news professionals also can be susceptible to indicators of users’ collective attitudes and behaviors, which they may interpret as actionable indicators of readers’ preferences. For one, as Webster notes, exposure metrics that permeate digital news spaces inform newsrooms’ decisions that shape future coverage (Webster 2014). The way online news is organized and presented is therefore consequential for both supply and demand sides. At the same time, digital platforms’ interfaces are to a large extent shaped by economic interests (Langlois and Elmer 2013), meaning that their designers do not always consider potential social impacts of their choices in the first place. Combined, these considerations render a seemingly esoteric subject such as design of online news interfaces a matter of public interest.
The results of my experiment suggest that at least some of digital news consumers can be more or less susceptible to cues contained in media coverage based on how a particular selection of content is curated, and by whom. This warrants closer examination of how the most trafficked news aggregating platforms structure their newsfeeds, and what effects, intended or not, it can have on users’ experience with information they encounter. In addition to scrutinizing digital platforms’ content moderation policies, activists and the broader public should critically examine their practices of information presentation. Some of the questions guiding such scrutiny could be these: Do users interpret the meaning of certain interface features the way their designers intended them to? Could there be a discrepancy between the intended meaning of the interface feature, user understandings and expectations of the content that it marks, and the actual content that the algorithm chooses to serve up? If, for example, the user assumes that the “top stories” section of a news portal contains the high-quality coverage of the most important stories of the day, but in reality it hosts the most-clicked stories on the topic in which this person expressed interest before, the miscommunication can contribute to formation of skewed priorities.

On the positive note, there is room for testing and deploying interface features designed to promote socially beneficial modes of news consumption. In this study, I undertook a modest attempt to test the effects of one of the possible variations of such an interface cue on news users’ issue priorities. Its lack of success should not discourage future academic and policy researchers from conducting similar tests across a variety of digital contexts and almost infinite possible cue designs. The failure of my attempt to convey a distinction between user interest and user-perceived importance should only be interpreted as a failure of this particular operationalization in the context of a single platform, Google News.
The finding that the likelihood of accepting news agenda as the source of users’ own problem importance judgements depended on levels of gatekeeping trust points to the importance of certain aspects of media literacy. Gatekeeping trust itself is a media literacy construct, and high scores on this measure indicate inaccurate, simplified understanding of news production practices. The good news is that media criticism interventions can diminish these potentially detrimental misperceptions (Pingree et al. 2013). Further still, in addition to established news-related perceptions, the growing prevalence of distributed discovery warrants focus on new dimensions of media literacy. We still know rather little about the extent to which digital news users are aware of the processes whereby news stories make their way to the screens of their computers and smartphones. The best estimate, however, is that the majority of people have little knowledge of the mechanisms involved in news production, aggregation, and distribution online. In order to diminish the potentially detrimental effects of news exposure in high-choice digital environments, educational programs in media literacy should focus on the role of digital intermediaries and social and algorithmic gatekeepers in shaping online information flows.
APPENDIX. IRB APPROVALS

ACTION ON EXEMPTION APPROVAL REQUEST

TO: Krill Bryanov  
Mass Communication

FROM: Dennis Landin  
Chair, Institutional Review Board

DATE: February 4, 2020

RE: IRB# E12095

TITLE: User Evaluation of a Multi-Source News Portal


Review Date: 2/3/2020  
Approved X  Disapproved

Approval Date: 2/3/2020  
Approval Expiration Date: 2/2/2023

Exemption Category/Paragraph: 2b

Signed Consent Waived?: Yes

Re-review frequency: Three years

LSU Proposal Number (if applicable):

By: Dennis Landin, Chairman [Signature]

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING –

Continuing approval is CONDITIONAL on:

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU's Assurance of Compliance with DHHS regulations for the protection of human subjects.
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.
3. Obtaining renewed approval (or submittal of a termination report), prior to the approval expiration date upon request by the IRB office (irrespective of when the project actually begins); notification of project termination.
4. Retention of documentation of informed consent and study records for at least 3 years after the study ends.
5. Continuing attention to the physical and psychological well-being of informed consent of the individual participants, including notification of new information that might affect consent.
6. A prompt report to the IRB of any adverse event affecting a participant potentially arising from the study.
8. SPECIAL NOTE: When emailing more than one recipient, make sure you use bcc. Approvals will automatically be closed by the IRB on the expiration date unless the PI requests a continuation.

* All investigators and support staff have access to copies of the Belmont Report, LSU's Assurance with DHHS, DHHS (45 CFR 46) and FDA regulations governing use of human subjects, and other relevant documents in print in this office or on our World Wide Web site at http://www.lsu.edu/irb
ACTION ON EXEMPTION APPROVAL REQUEST

TO: Kirill Bryanov  
Mass Communication  

FROM: Dennis Landin  
Chair, Institutional Review Board  

DATE: November 26, 2018  

RE: IRB# E11356  

TITLE: Evaluating Competing Explanations of Agenda Cueing in Online News Portal Users With Varying Levels of Gatekeeping Trust  

New Protocol/Modification/Continuation: Modification  

Brief Modification Description: Title change, treatment change, outcome measures changed.  

Review date: 11/21/2018  

Approved X Disapproved _________  

Approval Date: 11/21/2018 Approval Expiration Date: 11/7/2021  

Re-review frequency: (three years unless otherwise stated)  

LSU Proposal Number (if applicable):  

By: Dennis Landin, Chairman  

PRINCIPAL INVESTIGATOR: PLEASE READ THE FOLLOWING – Continuing approval is CONDITIONAL on:  

1. Adherence to the approved protocol, familiarity with, and adherence to the ethical standards of the Belmont Report, and LSU’s Assurance of Compliance with DHHS regulations for the protection of human subjects.  
2. Prior approval of a change in protocol, including revision of the consent documents or an increase in the number of subjects over that approved.  
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REFERENCES


VITA

Kirill Bryanov is a doctoral candidate in Mass Media and Public Affairs at the Manship School of Mass Communication, Louisiana State University, expected to graduate in August 2020. His primary area of scholarly interests is the social and political effects of communication technology, with a focus on digital platforms. Bryanov holds an undergraduate degree in Political Science from Saint Petersburg State University in Russia (2012) and a Master's degree in Political Science from Central European University in Budapest, Hungary (2015). He has worked as an applied media researcher for institutions in Russia and Hungary, as well as technology journalist for a variety of international media outlets. Upon completion of his doctoral studies, he will begin to work as a research fellow at the Higher School of Economics, a research university located in his home city of Saint Petersburg, Russia.