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Editorial

Media and Communication: Why Another Journal?

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Indeed, there are some three dozen English-language journals now that deal with one or another or multiple aspects of the field of media and (mass) communication. Would another journal not be redundant? We think not. Media and Communication, henceforth shortened to MaC, will possess a specific combination of attributes that are not replicated elsewhere and together result in the unique position of the journal.

MaC will be **timely**. It will be published when the editors believe there is a critical collection of articles to publish. It will not be known as quarterly or semi-annual, but as timely. No 1-year or 2-year or longer delays in making your refereed work available to the academic community.

MaC will be **online**. That is obvious from the fact that it can be 'published' when desired. This carries with it the attribute of nearly universal accessibility. Clearly the venerable journals in communication have come to recognize the need to be online, and thus convert. We need no conversion. We begin and end online.

MaC will be **international**. Other journals make this claim. Please examine the roster of editors and scholarly reviewers who have been assembled by the publisher of MaC. They represent more than a dozen countries and languages. It is their responsibility not only to review manuscripts, but also to solicit quality scholarship within their geographic region.

MaC will be **intercultural**. The well-known international journals in communication largely focus on the Anglo-American communities. We will try to publish innovative research done in other regions of the world that right now are marginalized within the field.

MaC will be **eclectic and multi-faceted**. Other journals tend to have a much narrower focus, either in subject matter or in favored methodology. We believe that the editors and reviewers of MaC have the abilities to recognize quality scholarship regardless of its substantive focus and/or its choice of methods. We conceive of media and communication research as an integrative discipline at the intersection of many other scientific fields.

MaC will be **open-minded and cosmopolitan**. We will provide a forum for new and challenging ideas in the field that focus on the transformation of media and communication and its social and cultural relevance in a globalized world.

MaC will be **free**. Open access for readers is self-explanatory. Libraries around the world will be able to subscribe to the journal for free, thus countering the immense costs that the big publishers are imposing on the free access to knowledge.

MaC will be **fair to its authors**. Our publisher pursues a new open-access model that enables not only established scholars but also young professionals and those from outside an institutional setting to publish their relevant contributions at relatively low cost. Our authors will always remain in possession of the copyright to their work.

Support for these assertions will come with time, in the form of high quality scholarly presentations.

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Media and Communication

Research Article

Understanding Social Media Logic

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Abstract: Over the past decade, social media platforms have penetrated deeply into the mechanics of everyday life, affecting people's informal interactions, as well as institutional structures and professional routines. Far from being neutral platforms for everyone, social media have changed the conditions and rules of social interaction. In this article, we examine the intricate dynamic between social media platforms, mass media, users, and social institutions by calling attention to *social media logic*—the norms, strategies, mechanisms, and economies—underpinning its dynamics. This logic will be considered in light of what has been identified as *mass media logic*, which has helped spread the media's powerful discourse outside its institutional boundaries. Theorizing social media logic, we identify four grounding principles—programmability, popularity, connectivity, and datafication—and argue that these principles become increasingly entangled with mass media logic. The logic of social media, rooted in these grounding principles and strategies, is gradually invading all areas of public life. Besides print news and broadcasting, it also affects law and order, social activism, politics, and so forth. Therefore, its sustaining logic and widespread dissemination deserve to be scrutinized in detail in order to better understand its impact in various domains. Concentrating on the tactics and strategies at work in social media logic, we reassess the constellation of power relationships in which social practices unfold, raising questions such as: How does social media logic modify or enhance existing mass media logic? And how is this new media logic exported beyond the boundaries of (social or mass) media proper? The underlying principles, tactics, and strategies may be relatively simple to identify, but it is much harder to map the complex connections between platforms that distribute this logic: users that employ them, technologies that drive them, economic structures that scaffold them, and institutional bodies that incorporate them.

Keywords: Facebook; mass media; media activism; platform analysis; social media; Twitter; viral

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1. Introduction

"Dutch teen's sweet sixteen party invitation goes viral on Facebook, ends in 3,000 rioting in Groningen suburb" was only one of many headlines summarizing the series of events that led to an outburst of violence in Haren (Netherlands) on Friday 21 September 2012 [1]. A girl posting an invitation to her sweet sixteen party accidentally put her Facebook-setting to "public", generating enormous buzz on social media platforms in the week preceding the party. When she realized her mistake, the teenager canceled the party, but this did not prevent thousands of people from organizing themselves online to join the celebration. Newspapers and television started to pick up the story a few days before the annulled gathering. The story got bigger as more people tapped into the viral stream. On the evening of 21 September 2012, broadcast media started to report live from Haren, where police had barricaded the streets while visitors from all over the country were pouring in. Some youngsters were wearing "Project X Haren" T-shirts, after the recent American film about a party that grows out of control. The police could not prevent serious rioting and by the next morning, the peaceful suburb of Haren counted 34 injured and millions in damages.

After what became known as "the Facebook riots", people quickly started to point fingers at one or more visible culprits: *Facebook*, which sparked the riots or did nothing to prevent them from happening; *mass media*, which fanned the fire with their on site reporting, which some argued substantially aggravated the crowds' impact; the *police* who were ill prepared and did not redress social media signals seriously; and finally, the *rioters* who deployed social media to "inflame" innocent youth and encourage many to participate in an outburst of violence. In the Dutch press, some defended the neutrality of social media as channels of communication, while others disputed this. Most commentators agreed that although Facebook and social media in general could not be held responsible for the "spontaneous" revolt, users and institutions should become more aware of the impact of these new tools [2]. The Haren city council issued an investigation, resulting in a thorough analysis of the role (social) media played in these events [3]. The report concluded that neither mass media nor social media could be pinpointed as causing these riots, but their merging *dynamics* were instrumental in shaping the course of events.

Over the past decade, social media platforms have penetrated deeply into the mechanics of everyday life, affecting people's informal interactions, as well as institutional structures and professional routines. We could look at them as the latest innovation in computer-mediated communication that poses serious challenges to existing institutions, such as mass media and government authorities. Indeed, the fast growth of online platforms forces everyone to adapt to a new reality, where the mass distribution of information, news, and entertainment seems no longer the privilege of the institutional few. Fast-growing networks like Facebook and Twitter with millions of active users are rapidly penetrating public communication, affecting the operational and institutional power balance of media systems. But "social media" or "mass media" are hardly autonomous forces in the organization of social events. Phenomena like the Haren riots materialize through an intricate web of online and offline settings connected by a dynamic constellation of technological, economical, and socio-cultural mechanisms.

In order to understand how this new media ecosystem reshapes social orders or chains of events, we want to call attention to *social media logic*—the strategies, mechanisms, and economies underpinning these platforms' dynamics. This logic will be considered in light of what has previously been identified as *mass media logic*, which helped spread the media's powerful discourse outside its proper institutional boundaries. After reintroducing mass media logic, we will turn to social media logic and identify four grounding elements to describe how this logic functions: programmability, popularity, connectivity, and datafication. Social media logic, as we will argue, is increasingly becoming entangled with mass media logic; and even though these logics are mutually reinforcing, they are also succinctly different. The logic of social media, as was previously the case with mass media logic, is gradually dissipating into all areas of public life; the cultural and commercial dynamics determining social media blend with existing commercial and advertising practices, while also changing them. Far from being neutral platforms, social media are affecting the conditions and rules of social interaction. Therefore, their sustaining logic deserves to be scrutinized in detail to better understand its impact in various domains.

2. Mass Media Logic

During most of the twentieth century, mass media gained power not only by cementing their institutional status, but also by developing a commanding discourse that guided the organization of public space. The formal grid of understanding that steers information, news, and communication was effectively exported to vital areas beyond media organizations, where mass media gained legitimacy mostly through the influence of its logic. Over thirty years ago, David Altheide and Robert Snow (1979) defined (mass) media logic as a set of principles or common sense rationality cultivated in and by media institutions that penetrates every public domain and dominates its organizing structures: "In contemporary society, every institution has become part of media culture: changes have occurred in every major institution that are a result of media logic in presenting and interpreting activity in those institutions" ([4], p. 11). The power of mass media, they argued, was mostly diffused and exercised through discursive *strategies* and performative

tactics that became accepted as "natural" or "neutral" in all kinds of institutional contexts.

So what strategies and tactics make up *mass* media logic in its original formulation? When defining media logic in the late 1970s, Altheide and Snow singled out a number of elements, partly relating to its ability to frame reality and partly pertaining to media's claim towards neutrality or independence. For instance, media logic presents the world as a continuous flow of events, an incessant stream of things and people "out there". The nature of media logic is "to saturate coverage of events over a short period of time, slack off, and eventually turn to something else" ([4], p. 238). Topics wax and wane in the public's attention, but there is nothing natural about this stream; media have a distinct interest in constantly renewing themes so people keep coming back to their outlets. This applied to print but even more so to television. According to Raymond Williams, broadcast media create a programmed flow, which captures the attention of audiences and glues them to the screen [5]. The rationality of quick turnover rates dominates the selection of news itself, like a commodity principle. Moreover, television's ability for liveness shows the tendency to stage its flow of programmed events as unmediated real-life registration [6-8]. Television cameras and broadcast techniques add immediacy and intensity to the rhetorical power of words: shots of bloody victims or sweating presidential candidates have emotional impact, enhancing television's potential to sway large audiences towards collective pathos.

Secondly, the tendency of mass media is to present themselves as neutral platforms that fairly represent different public voices and opinions, whereas in fact they operate as filters through which some people get more exposure than others. Implied in the original theory of media logic was the appearance of institutional independence—independence from state or commerce—and to present its products as balanced representations of the public interest by means of discursive and procedural strategies. Discursively speaking, news items were separated from advertisements, and opinion distinguished from facts. As Altheide and Snow observed, the seeming neutrality of media logic was activated through staging experts speaking on behalf of institutions (e.g. the police or science), or by singling out representatives of the people's voice. Some people become media personalities not as a result of their specific knowledge, but by virtue of their ability to fit in with specific media formats: "[T]heir opinion and advice is not sought for the knowledge they might have, but because of their fame as people who operate within the familiar form of media logic" ([4], p. 241).

Another part of media logic derives its impact from the way it has anchored its seeming independence and neutrality in standardized procedures, for instance, neutral presentation by anchors, coverage of events by reporters, and subjective commentaries by authoritative voices—formats that are widely adopted and imitated outside media proper. One of the most insidious aspects of media self-legitimation, Altheide and Snow ([4], p. 245) contended, was the use of ratings, polls, and other surveys as scientific evidence of audience demand and also as a legitimizing tool for amplifying "representative" public voices.

The articulation of media logic in the late 1970s posed an alternative view to the many institutional, techno-political, and economic theories of media—analyses that often regarded mass media as institutional occupants of the public sphere. Unfortunately, the theory of media logic was never updated to include the many significant changes media underwent in the last two decades of the twentieth century. One such important shift was the proliferation, in the early 1980s, of cable television and the emergence of special niche audiences rather than mass publics; another important change was the general commercialization of culture, where news and information were increasingly infused by advertising practices in which facts and opinion were progressively mixed [9-11]. Media logic adapted to these new market realities by deploying many of these proven strategies and tactics to reaffirm boundaries that had long started to erode: boundaries between news and advertisements, facts and opinion, public service and commerce.

As a result, so-called public values were transported outside its institutional sphere to enhance corporate or state legitimacy [12]. For example, the news routine of quoting certified experts was imitated in advertising, where professors in lab coats cited "evidence" of research outcomes to promote branded products. The division between content and commerce became even fuzzier as content producers—particularly producers of news—were pressured to obey to the laws of the market or give in to public demand [13]. Government officials began to hire public relations officers to massage their relationship with citizens; and politicians employed spin-doctors to influence public opinion and voters [14-16]. Commercial stations such as Fox News demonstrate how media outlets copy the superficial trappings of media neutrality while explicitly articulating an ideological stance. Over the past decades, broadcast producers perfected audiovisual grammar to steer collective emotions and feelings, and this part of media logic quickly disseminated to all kinds of areas. Political elections are no longer thinkable without the fight to control camera angles; the same spotlights framing movie stars and sports heroes also frame political messages. Coverage of citizen revolts (from Beijing's Tiananmen Square in 1989 to Cairo's Tahrir Square in 2010) would not have had worldwide impact without protestors understanding the laws of mass media logic, resulting in arresting images of bloody protestors, spokespersons, and gripping action footage [15,17-19]. Commercials, entertainment, and news all blend into a seamless flow of images, defined by the televisual laws of ever-shorter sound bites, glitzy shots, and poignant close-ups.

These changes in media organizations as well as in mass media's technological affordances have rendered the explanatory power of media logic as a legitimizing force even more intriguing. However, while much critical work has focused on conceptualizing media as public *spaces* or *spheres*, media *logic* has remained under-theorized in communication and media studies. The allure of such focus becomes particularly poignant when new technological and economic mechanisms emerge, transforming the character of the media landscape at large and media logic in particular. Besides the general transformations of the 1980s sketched above, there are a number of developments that have reshaped media logic, including the emergence, in the 1990s, of computer mediated interaction through the Web, the ubiquity of mobile computing, and the growth of social media platforms. Various technological and cultural trends in computing converged in the meteoric rise of social media platforms, which, in turn, greatly accelerated the transformation of the media landscape as well as of other social domains. Along with these changes came a new set of technological, economic, and socio-cultural mechanisms, which we would like to refer to as *social media logic*. Social media logic needs to be distinguished from mass media logic because the two sets of strategies and tactics emerged from a different technological and economic lineage. We explore below how social media logic blends with "established" mass media logic, while also adding new elements and transforming already existing mechanisms.

3. Elements of Social Media Logic

Social media can be roughly referred to as a "group of Internet-based applications that build on the ideological and technological foundations of the Web 2.0 and that allow the creation and exchange of user-generated content" ([20], p. 60) The quick rise of social media platforms in the first decade of this century was part of a more general networked culture where information and communication got increasingly defined by the affordances of web technologies such as browsers and search engines. Social networking sites like Facebook, Twitter, and LinkedIn as well as user-generated content sites, including YouTube and Flickr, became the core of a host of web-based applications that together formed an expansive ecosystem of connective media [21]. Inferring from these conditions, we contend that social media *logic* refers to the processes, principles, and practices through which these platforms process information, news, and communication, and more generally, how they channel social traffic. Like mass media, social media have the ability to transport their logic outside of the platforms that generate them, while their distinctive technological, discursive, economic, and organizational strategies tend to remain implicit or appear "natural". In order to explicate social media logic as a particular set of strategies and mechanisms, we select four main elements for further elaboration: programmability, popularity, connectivity, and datafication. The point of identifying these four elements is not to provide an exhaustive analytical model of social media logic, but to identify a few of its main contrivances and illustrate their systematic interdependence. In addition, we will argue how social media logic is entangled with mass media logic, and how this intricate choreography affects the relative shaping of private, corporate, and state forces.

3.1. Programmability

When print and broadcasting still dominated the mediascape, the term "programming" related to scheduled content. Following Raymond Williams, Altheide and Snow noticed how programming was an editorial strategy for channels and broadcasters to glue their audiences to the screen from one segment to the next [4,5]. In mass media logic, the term thus referred to technology *and* cultural form: the ability of a central agency to manipulate content in order to define the audience's watching experience as a continuous flow. When gravitating towards the Web, the concepts "programming" and "flow" acquired a different meaning, shifting their emphases from content and audiences to *code* and *users*, and from programmed flow to *programmability*. In social media logic, one-way traffic yielded to two-way traffic between users and programmers—a process that affected both the technological and social mediation of content [22]. On sites like Twitter or Reddit, users can post content and steer information streams, while the sites' owners may tweak their platforms' algorithms and interfaces to influence data traffic. Programmability can hence be defined as the ability of a social media platform to trigger and steer users' creative or communicative contributions, while users, through their interaction with these coded environments, may in turn influence the flow of communication and information activated by such a platform.

The first part of this definition is grounded in *technology*, and pertains largely to computer code, data, algorithms, protocols, interfaces and the platform organizations that are responsible for programming [23]. While algorithms are nothing but sets of coded instructions, it is important to observe how social media platforms shape all kinds of relational activities, such as liking, favoriting, recommending, sharing and so on. For instance, Facebook's interface channels users into "friending" other users, implicitly redefining this social concept [24]. Some algorithms, like the one underlying the "people you may know button" on LinkedIn, automatically suggest social relations on the basis of inferred data. The power of algorithms, as David Beer contends, lies in their programmability: programmers steer user experiences, content, and user relations via platforms [25].

These technological mechanisms are often invisible. Coding techniques are difficult to observe except through visible user interfaces and application programming interfaces (APIs), and sometimes though their (open) source codes. Unlike the television schedules of mass media logic, technological programmability in social media logic is hard to analyze in part because algorithms are proprietary and thus kept a secret, and partly because they are constantly adapted to evolving business models and user practices [24,26]. As American media studies scholar Tarleton Gillespie explains, the programmability of social interaction has become paradigmatic in a media environment dominated by platforms: we now rely on the algorithmic assessment of information just as we used to rely on credentialed experts or scientific evidence in the discourse of mass media [27]. Editorial (human) choices, as Gillespie contends, have not vanished; on the contrary, programmability means that human editorial selections are processed imperceptibly and automatically [28].

The second part of the programmability definition, though, relates to *human agency*: users retain significant agency in the process of steering programmability not only through their own contributions but also because they may resist coded instructions or defy protocols. In response to actual usage, a platform may need to adjust its policies in order to keep pleasing its crowds and advertisers. Reddit, a social media site with some 62 million users, illustrates this two-tiered rationality: the site lets its registered users—anonymous or identifiable—post comments or links to topics deemed noteworthy. Reddit generally leaves more power to its users in terms of what to post and how to channel attention to a topic than Facebook or YouTube. Anyone who starts a "SubReddit" becomes his or her own editor of the flow of information, deciding who can add and who has access. As an "attention aggregator", Reddit relies on its algorithms as well as on the vigilance of its users to operate the platform; its operators refuse to take on the role or responsibilities of news reporters, thus defying an editorial function. However, exporting this new social media logic—the mutual shaping of the information flow by owners and users—to discourses outside the platform proper, inevitably leads to a blend with mass media logic. In April 2013, a police hunt for the suspects of the Boston Marathon bombers fueled a SubReddit "findbostonbombers", which led to a stream of amateur sleuths and false accusations towards innocent high school students. When Reddit was vehemently criticized for its lack of editorial accountability, the platform issued an apology and promised to change its tactics—enhancing its codes and protocols as well as fortifying its users vigilance and filter substreams for their tone of voice.

The logic of programmability thus inevitably mixes the crowdsourcing principles of social media with the editorial values expected of mass media. In mass media logic, "programming" referred to an *editorial* strategy that manifested itself through the selection, juxtaposition, and promotion of certain items in the flow of scheduled content. Now that the flow has taken an "algorithmic turn," content is not just programmed by a central agency, even if this agency still has considerable control; users also participate in steering content, distinguishing it from William's programmed flow [29]. The Reddit example shows how platform owners are not the only power brokers in the social media universe: users themselves also have the ability to shape these algorithmic mechanisms. They can either "go with the flow" or they can manipulate coded interaction, for instance by massively retweeting or liking particular content, thereby pushing a topic to become trending. In doing so, platform programmers and users continuously negotiate the terms of social interaction. In the case of the Facebook riots in Haren, cited at the beginning of this article, users exploited the programmability of various platforms, not only by deliberately ignoring the erroneous privacy setting of the sixteen-year-old girl, but also by exploiting the platform's functionality to send the message to as many "friends" as possible.

Due to the two-way nature of online traffic, programmability has serious consequences not only for the design of "platformed" sociality but also for social activities mitigated by social institutions, such as the mass media and law and order. Although programmability might be considered as a unique game changer, as a central element of social media logic it is inescapably part of a larger configuration. It has not only become intricately intertwined with the logic of *mass* media, but also with the strategies of advertising, public relations, activism, and other public discourses. We will return to this larger configuration in a later section.

3.2. Popularity

A second principle of social media logic is popularity. Mass media logic already divulged a potent mechanism for pushing "likeable" people to become media personalities; depending on their ability to play the media and lure crowds, a variety of actors, from politicians to entertainers, accumulated mass attention, often achieving the status of celebrity. Besides fame and popularity, mass media's power in terms of agenda setting or pushing certain topics to the fore has been a much-theorized subject amongst academics [30]. As Altheide and Snow already contended in 1979, mass media's ability to shape public opinion by filtering out influential voices and assigning some expressions more weight, attested to its power [4]. In the early years of their existence, social media platforms held the promise of being more egalitarian and democratic than mass media in a sense that all users could equally participate and contribute content. However, as platforms like Facebook and Twitter matured, their techniques for filtering out popular items and influential people became gradually more sophisticated. Al-

though each platform's strategies for advancing some topics and prioritizing particular users differ, we will try to describe the general underpinning dynamics involved in online popularization. How does the pursuit of online attention become part of a media logic that influences what people find important? And how does this logic mesh with (mass) media logic in online or offline public discourses, even if they arise from separate conditions?

In line with the feature of programmability, popularity is conditioned by both *algorithmic* and *socio-economic* components. Each platform has its distinct mechanisms for boosting popularity of people, things, or ideas, which is measured mostly in quantified terms. Inscribed in Facebook's EdgeRank and Twitter's Trending Topics are algorithms that push some topics and devalue others [24,28,31] Facebook's Like-scores automatically select emotive and positive evaluations of topics, rather than asking for complex assessments. The Like-mechanism claims to promote a social experience but the button simultaneously figures in an automated "like-economy" [32]. Along similar lines, Twitter's Trending Topics feature enables users to boost certain topics or news items, while Retweets offer a tool to widely "endorse" a specific tweet. But Twitter also actively pushes Promoted Tweets—paid for by companies and personalized via algorithms to fit specific Twitter-streams. In spite of the platform's egalitarian image, some people on Twitter are more influential than others, partly because the platform tends to be dominated by few users with large followings, partly because the platform assigns more weight to highly visible users. For instance, users such as CNN's Middle East correspondent Christiane Amanpour get more weight than other experts or witnesses. Popularity boosting is thus two-way traffic: algorithms automatically assign differentiated value, but users themselves may also engage in concerted efforts to lift certain people's visibility.

Platforms themselves have an increasing interest in standardizing their metrics and making them meaningful in social life outside their platform proper. The logic of online popularity resides in banners for "most viewed" videos on YouTube, friend stats on Facebook, or follower counts on Twitter. Furthermore, each platform is in the business of developing its own thermometer for measuring aggregated popularity or influence: we now have Facebook Memology for a top-ten of most popular topics, Google Analytics for measuring a site's traffic and sales, and Twitter's top-100 of people with the largest followings. Each corporation actively seeks to promote their popularity and ranking mechanisms in order to enhance the value of its platform and its users.

Besides individual platforms deploying these strategies, there are also a number of new platforms who measure popularity scores and reputational rankings across the board: Klout scores calculate individual user's presence and influence on all platforms by deploying complex—and often controversial—algorithms [33]. Based on this number, advertisers or employers may single out certain "superusers" and pay them to perform promotional tasks or jobs ("People with a Klout score below 45 need not apply"). In the online ecology of platforms, popularity and influence have created their own standards, complementing the popularity metrics already distributed by mass media.

On the one hand, social media logic *complements* mass media logic and enhances its dominant norms and tactics, just adding an extra dimension. Traditional mass media have wielded popularity filters for decades; one just needs to think of *Time Magazine*'s list of "100 most influential people" and its "Person of the Year". And, as Altheide and Snow already noticed, the "vox-pop strategy" is an age-old tactic—singling out citizens as spokespersons for a certain public segment [4]. Social media's claim that online metrics complement popularity tactics already wielded by mass media is therefore an evidential part of its logic. Influential Twitter users are beginning to find their way into the star-system of mass media alongside media celebrities; TV-shows increasingly define the "news of the day" or decide whom to interview on the basis of Twitter trends or by looking into Facebook discussions. Journalists from news media often treat tweets from celebrities or politicians as quotes—a peculiar reinforcement of Twitter's powerful function as a public relations tool. Platform metrics are increasingly accepted as legitimate standards to measure and rank people and ideas; these rankings are then amplified through mass media and in turn reinforced by users through social buttons such as following and liking.

What makes this element of social media logic different from mass media logic, though, is its ability to measure popularity at the same time and by the same means as it tries to *influence* or *manipulate* these rankings. The entangled activities of measuring and manipulating expose a platform's technological affordances, while concurrently reflecting users' ability to push specific interest to the frontlines of public attention. Groups of users who decide something needs to become "trending" can orchestrate a publicity wave to promote a particular item, which, as the Occupy movement protestors found out, can be challenging on popular platforms such as Twitter [34] In the example of the Facebook riots in Haren, a group of opportunists shrewdly deployed the Like and ReTweet buttons to stage a party that was not a party, and they managed to mesh up their powerful social tools with the prevailing tactics of mass media to achieve their preset disruptive goals. Along similar lines, Facebook and Twitter's platform owners have used their popularity rankings to promote commercial, public, or charity causes (e.g. organ donation by Facebook's Mark Zuckerberg) [35]. It is exactly the export of social media popularity mechanisms to other social or commercial environments that proves the efficacy of its logic in challenging existing social hierarchies or unsettling discursive orders.

Mass media logic and social media logic get incrementally entangled in defining the popularity of issues and the influence of people. Popularity becomes enmeshed in a feedback loop between mass and social media, and, as was argued in the case of programmability, becomes part of a larger cultural arena where different institutional discourses and counter-discourses engage in a struggle to make their logics more pressing. Two more elements play a central role in the syntax of social media logic: connectivity and datafication.

3.3. Connectivity

In Altheide and Snow's theory on mass media logic, "the media" was generally presented as an amorphous palette of media organizations whose aim—dependent on their public or commercial objectives—is to connect content to citizens or to link advertisers to consumers [4]. Traditional media institutions have always addressed particular national or regional audiences in crafting news, information, and entertainment while selling audience attention to geographically or demographically assorted customers. When social media platforms emerged in the early 2000s, their primary pursuit seemed to be *connectedness*: Facebook, established in 2004, wanted college students to be able to connect and share, whereas user-generated content platforms such as YouTube, started in 2005, aimed at connecting users to (self-made) content. Many social media platforms—the most prominent of these being Facebook, YouTube, and Twitter—still promote their networked services as enablers of human connections. However, even if human connectedness or "participation" is still a valid part of social media's logic, a more encompassing and accurate term to capture this element of logic is connectivity. Connectivity, which originated as a hardware term, refers to the socio-technical affordance of networked platforms to connect content to user activities and advertisers. More precisely, in a connective ecosystem of social media, the "platform apparatus" always mediates users' activities and defines how connections are taking shape, even if users themselves can exert considerable influence over the contribution of content.

Connectivity partly overlaps but also distinctly differs from the notion of "spreadibility" introduced by Henry Jenkins, Sam Ford and Joshua Green [36]. While spreadibility recognizes "the importance of the social connections among individuals" they contend that these connections are merely "amplified" by social media platforms ([36], p. 6). The notion of spreadibility accentuates the power of audience agency, while deemphasizing the power of platform agency as a steering force. Connectivity, instead, equally emphasizes the *mutual shaping* of users, platforms, advertisers, and, more generally, online performative environments. Unlike mass media, social media platforms seldom deal with "natural" geographically or demographically delineated audiences; instead, they expedite connections between individuals, partly allowing the formation of strategic alliances or communities through users' initiative, partly forging target audiences through tactics of automated group formation ("groups you may be interested in" on Flickr) or personalized recommendations ("People who bought this item also bought…" on Amazon). Connectivity introduces a bipolar element into the logic of social media: a strategic tactic that effectively enables human connectedness while pushing automated connectivity. A number of theorists have chosen one side of this double logic, either to hail social media's liberating and communitarian potential, or to lament some platforms' predispositions as vehicles for customized advertising [37]. Our point in introducing the element of connectivity is to argue how social media logic does both at the same time. Let us look more closely to each end of this fallacious opposition.

The *human connectedness* efficacy of social media derives from early network sociology. Well before the rise of social platforms, sociologist Barry Wellman and colleagues argued that new media technologies involve a substantial shift in sociality from densely knit groups to loosely bounded social networks of relations, which he labels "networked individualism". Networked individualism presupposes that people directly connect to other people with whom they are involved in specialized relationships of common interest. This type of sociality revolves around the person rather than the group or locality [38,39]. New media, and especially also social platforms, ostensibly offer users the opportunity to pick and choose others to connect with and communicate on a personal basis. From this perspective, these media allow individuals to create their own customized social networks and communities (for a critical analysis of these trends see [40,41]).

Particularly interesting in this regard is the work by Bennett and Segerberg, who observe in their research on contemporary protests a shift from "collective" action to "connective" action [42]. They maintain that protest movements have traditionally depended on the construction and spreading of collective identification and action frames, which require formal hierarchical organizations and membership groups, to educate people and tie them to these frames [43-45]. According to Bennett and Segerberg, in contemporary protests this type of collective action is mixed with connective action—a hybrid that increasingly applies "to life in late modern societies in which formal organizations are losing their grip on individuals, and group ties are being replaced by large-scale, fluid social networks" ([42], p. 748). The authors emphasize that these networks do not require strong organizational control or a collective identity; instead, social technologies function as organizing agents. For instance, in the 2011 Occupy movements, technology-enabled personal networks did not simply function as communication systems but also empowered flexible organizations that allowed rapid action and coordinated adjustments. In our example of the Haren riots, people

who had never met before rapidly refashioned Facebook and Twitter into organizational instruments.

In the double logic of connectivity, the flipside of networked individualism seems to be networked customization or *automated personalization*. When mass media still reigned, the alliance between consumers, content (or products) and advertisers always entailed a strategic deployment of recommendations and social networks to sell goods or services. Whether it be doctors in white coats, department store "loyalty-cards", neighbors organizing Tupperware parties, or endorsements from friends or celebrities—recommendation culture predates the advent of social networks. What is new in the context of social media networks, though, are the mechanisms of deep personalization and networked customization. These terms refer to online content calibration based on assumptions about individual user's needs and platform owners' or advertisers' interests. Connectivity should thus be seen as an advanced strategy of algorithmically connecting users to content, users to users, platforms to users, users to advertisers, and platforms to platforms. But the boundaries between human connections and commercially and technologically steered activities are increasingly obfuscated. For instance, automated links between users and products via Facebook Likes help advertisers utilize recommendation tactics for promoting products to "friends"—even if users are unaware of their being used for these purposes.

The recommendation culture grounded in automated connectivity shows the same Janus-face quality as we noticed with regards to networked individualism: some users appreciate the service offered by platforms to connect them to likeminded people, preferred items, or individualized taste; others loathe networked customization as a signal of intruded privacy or commercial exploitation of user information. Our point is not to side with any one side of this contentious equation, but to analyze how the connectivity element, as part of social media logic, is deployed to reshape hierarchies between private, public, and corporate interests. Connectivity in the context of both networked individualism and networked customization are significant new armaments in the struggle to redefine the boundaries between private and public and between commerce and state. Even though YouTube, Facebook and Twitter employ different mechanisms for enabling and forging connections, their various strategies fit a coherent logic. However, if we want to understand the mechanisms underpinning their interoperability, we need to turn to the fourth element in which social media logic is rooted: datafication.

3.4. Datafication

Part of mass media logic, especially television, was always the ability to reach mass audiences in real time coupled onto their ability to do audience research. Television's magic was (and still is) its ability to draw large crowds to watch live images—liveness still carrying the connotation of unmediated events evolving in real time, simply "captured" by the camera's eye and often signifying emotion and intensity [6,8]. Knowing more about viewer's profiles and tastes not only helped fine-tune programming decisions but also provide advertisers with precise figures to make paid messages more effective. Altheide and Snow already remarked how the use of ratings, polls, and other surveys served as predictors of audiences' predilections [4]. One might argue that mass media's ability to enhance audience predictability and to provide real-time audience experiences is an essential ingredient of its powerful logic. If we subsequently look at social media logic, we may discern how platforms have developed their own strategies for predicting and repurposing user needs, while also nursing their own equivalent of "real-timeness". Both notions, we contend, are grounded in the principle of datafication.

Datafication, according to Viktor Mayer-Schoenberger and Kenneth Cukier, refers to the ability of networked platforms to render into data many aspects of the world that have never been quantified before: not just demographic or profiling data yielded by customers in (online) surveys, but automatically derived metadata from smart phones such as time stamps and GPS-inferred locations [46]. When it comes to computer-mediated communication, each type of content—be it music, books, or videos—is treated as data; more specifically with regards to social networking platforms, even relationships (friends, likes, trends) are datafied via Facebook or Twitter. All three elements heretofore explored—programmability, popularity, connectivity—are grounded in the condition of datafication. In early theories of social media, (meta) data were often considered a byproduct of online networks, but as platforms gradually matured, they have turned more into data firms, deriving their business models from their ability to harvest and repurpose data rather than from monetizing user activity proper [40]. Datafication endowed social media platforms with the potential to develop techniques for predictive and real-time analytics.

Social media platforms, like mass media, handle a variety of online systems for rating, polling, and surveying user responses; but beyond expressly triggered responses, platforms ostensibly have the capacity for polling *built into* their architecture. Facebook and Twitter increasingly wield their potential to mine online social traffic for indicators of trending topics, keywords, sentiments, public viewpoints, or frequently shared and liked items. Microblogging tool Twitter, more than any other platform, promotes itself as an echo chamber of people's opinions, even positioning itself as a replacement of offline opinion polls [47]. The idea that social media are neutral, unmediated spaces is an important assumption ingrained in many definitions of data flows. Part of social media's logic lies in the assertion that data are "raw" resources merely being "channeled" through online veins, allow-

ing researchers to perform "opinion mining" or "sentiment analysis" [48-50]. Twitter supposedly measures informal sentiments, feelings, or underbellies of "the people" at a stage when they are still in the process of becoming "official" public opinion.

Lisa Gitelman aptly coined the adage "'raw data' is an oxymoron", meaning that data are always already *prefigured* through a platform's gathering mechanisms [51]. Moreover, in processing data, a platform does not merely "measure" certain expressions or opinions, but also helps mold them. In opening up "spontaneous" sentiments and opinions to the public eye, platforms have rendered them formalized and preformatted expressions—even though many tweets appear, to say the least, unpolished. Hence, they can be assessed and influenced by third parties. Opinions and sentiments expressed via Twitter are extremely vulnerable to manipulation—following a similar dynamic as social theorists previously identified as pertaining to the role of opinion polls in mass media logic [52]. The idea that you can tap into people's unconsciousness or "idea formation" without affecting the processes of opinion making is a basic misconception, which goes back to the classic observer effect—a concept familiar to research method literature across disciplines [53].

What makes datafication a crucial characteristic for social media logic is its ability to add a *real-time data dimension* to mass media's notion of liveness. Facebook, LinkedIn, and particularly Twitter process large quantities of users' behavioral data every second. Much of social media data's value lies in their real-time "live" appearance: platforms claim they can track instantaneous movements of individual user behavior, aggregate these data, analyze them, and subsequently translate the results into valuable information about individuals, groups, or society at large. Social media logic of detecting representative trends based on real-time analytics is increasingly mingling with polling strategies established by mass media logic. For instance in the case of television audiences, Twitter claims to have equaled the Nielsen ratings technique to measure evaluative viewer responses [54]. Social media data streams are increasingly used as real-time analytics to complement or replace traditional polls issued by news media or professional agencies. While the real-timeness of social media significantly differs from the liveness of television, the blend of these two has considerable implications for both types of media as well as for public discourse at large. Think, for instance, of online analysts tracking Twitter data during live broadcasts of political debates, while partisan lobbyists are simultaneously trying to influence the course of the debate via Twitter [55,56].

While datafication underpins the online platforms' strategies of predictive and real-time analytics, it does not intrinsically ascribe *either* commercial *or* public meaning to social media logic; instead, the deployment of these tactics in specific (institutional) contexts affords users and platform operators to attribute *meaning*. The principle of datafication can be used to predict user taste and insert personalized ads—as discussed in the previous section. However, data streams can also be aggregated to identify public health issues, such as flu-epidemics being traced through Twitter data. Consequently, this information can be used to send targeted ads for flu medication to all Twitter users in a particular afflicted area or to those twitterers using specific key words. The very same data can serve as input for epidemiologists to help develop early warning systems.

Many (state and corporate) sectors are currently experiencing the power of datafication strategies developed by social media, and try to incorporate them into their arsenal of available instruments. Police or law enforcement, for instance, can use real-time data for surveillance purposes. In the case of the Haren riots, police inspectors used the many videos of rebelling youngsters—put up on YouTube by youth themselves on the evening of the riots to attract more people to the scene—for the purpose of identifying and bringing to court a number of law offenders. Platforms like Twitter generate piles of data that may be extremely relevant to researchers interested in understanding social movements, group behavior, or large-scale health trends. Authorities or corporations, for their part, may assign very different value or meaning to interpretations pursed out of these data piles.

One thing we should always take into account is the fact that generators of online data, particularly social media platforms like Twitter, Facebook, YouTube, and LinkedIn, are never neutral channels for data transmission. An important aspect of datafication is the *invisibility* or naturalness of its mechanics: methods for aggregation and personalization are often proprietary and thus often inaccessible to public or private scrutiny. Questions of ownership and privacy concerns are commonly leveled at data themselves: who can access private data and who is allowed to sell aggregate data? Can platforms be forced to surrender users' private data to the authorities? The effectiveness of legislation that regulates agency and ownership in democracies that function mostly through national legislative contexts is increasingly problematic in a world where social media companies and data firms operate globally.

As important as these questions are, datafication logic also triggers more profound questions concerning the changing norms of a data-driven, global social economy. Reflecting on the underlying principle of datafication, it again becomes clear how the rise of social media affects user agency in complex ways. As Wendy Chun has noticed, interactive real-time interfaces *empower users* and "buttress notions of personal action, freedom, and responsibility," while at the same time they *empower platforms* to steer and exploit users' activities ([57], p. 74). The invisibility of datafication processes prompts questions about the actual relationship between data and users: are (real-time) data

flows indeed a reflection of real live activities, or are they the result of manipulative monitoring and steering? In the words of Louise Amoore ([58], p. 24), real-time data flows may say less about us, but more about "what can be inferred about who we might be".

Combined with the elements of programmability, popularity, and connectivity, the principle of datafication has profound implications for the shaping of social traffic. Predictive analytics and real-time analytics are new tools in the struggle to prioritize certain (corporate, public, or private) values over others. We should try to understand these complex dynamics not just as they unfold within the boundaries of social media platforms proper, but in their confrontations with different logics dominating other institutional contexts. Therefore, it is crucial to further develop a theoretical model that helps understand how all elements work interdependently in creating a coherent fabric, and also helps explain how this social media logic mixes with (offline) institutional logics. The double-edged sword of empowerment—of users and platforms—is a recurring trope in the evolving socio-technical logic of social media.

4. Social Media Logic and the Redefinition of Public Value

The four elements of social media logic—programmability, popularity, connectivity and datafication—are pivotal in understanding how in a networked society social interaction is mediated by an intricate dynamic of mass media, social media platforms, and offline institutional processes. Over the past years, social media logic has gradually infiltrated mass media logic, sometimes enhancing it, sometimes undercutting or replacing parts of it. By shifting our focus away from institutions to (social) media logic as a transforming force, we wanted to identify key principles propelling social interaction in a networked data-driven ecology. Concentrating on the mechanisms and strategies at work in social media logic, we tried to theorize a new constellation of power relationships in which social practices are profoundly reshaped [17]. We raised questions such as: How does social media logic modify or enhance existing mass media logic? And how is this new media logic exported beyond the boundaries of (social or mass) media proper?

The principles, mechanisms, and strategies underlying social media logic may be relatively simple to identify, but it is much harder to map the complex connections between platforms that distribute this logic: users that use them, technologies that drive them, economic structures that scaffold them, and institutional bodies that incorporate them. If we return to the example of the "Facebook riots" in Haren, cited at the beginning of this article, we refused to pinpoint one particular actor as the main culprit of an unpredicted series of events. What we did instead was to "reassemble the social", to use Bruno Latour's terminology, by deconstructing the logic by which these events occurred; not to locate a responsible actor or cause, but to learn more about the mechanisms and principles involved in the shaping of such events. [59]. Put simply: what happens when social media logic meets other institutional logics outside the context of social media platforms proper? In contemporary society, no institution can afford to look away from this logic because they have all become implicated in the same media culture: every major institution is part and parcel of this transformation in which the social gets infiltrated by a revamped media logic.

Over the past few years, social media have sometimes erroneously been regarded as ready-to-use tools for citizens, rioters, journalists, and activists to bring about social change, whether civil disruption, such as in Haren, or social uprisings, such as the ones in Tunisia and Egypt in 2011, which were casually tagged as "the Twitter revolutions". Epithets such as these divulge deceptive assumptions about the role of social media and their relation to mass media, users, and social institutions [60,61]. In the field of social activism, Facebook, YouTube, and Twitter are attributed momentous influence in the processes of mobilizing a following. As we have argued in this article, social media platforms can neither take credit nor blame for single-handedly transforming social processes or for turning around events. Like the mass media in the 1960s and 1970s, which were regarded as major influential forces in reshaping social order, social media, in the first decades of the new millennium, are likely to be seen as new unruly forces in a global transformation.

We neither intend to applaud the successes of these media nor rally against their insidious affects; the aim is to systematically analyze social media mechanisms as sources of transformation. Examining media logic, mass media and social platforms can hardly be seen as separate forces when it comes to controlling information and communication processes. As conventional mass media are just starting to grapple with this new logic, other institutions, too, realize they can hardly escape the imperative of social media logic. Not just police, law enforcers, and activists, but all kinds of actors—in education, politics, arts, entertainment, and so forth—are confronted with the basic contrivances of programmability, popularity, connectivity, and datafication. The elements of social media logic identified in this chapter should help to understand the nature of communication and information processes in the networked conditions of social life. By offering a systematic exploration of the logic sustaining this messy dynamic, we hope to inspire other researchers to look at specific case studies through this analytical prism and to critically interrogate the connections we have drawn.

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Research Article

Agenda Trending: Reciprocity and the Predictive Capacity of Social Networking Sites in Intermedia Agenda Setting across Topics over Time

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Abstract: In the contemporary converged media environment, agenda setting is being transformed by the dramatic growth of audiences that are simultaneously media users and producers. The study reported here addresses related gaps in the literature by first comparing the topical agendas of two leading traditional media outlets (New York Times and CNN) with the most frequently shared stories and trending topics on two widely popular Social Networking Sites (Facebook and Twitter). Time-series analyses of the most prominent topics identify the extent to which traditional media sets the agenda for social media as well as reciprocal agenda-setting effects of social media topics entering traditional media agendas. In addition, this study examines social intermedia agenda setting topically and across time within social networking sites, and in so doing, adds a vital understanding of where traditional media, online uses, and social media content intersect around instances of focusing events, particularly elections. Findings identify core differences between certain traditional and social media agendas, but also within social media agendas that extend from uses examined here. Additional results further suggest important topical and event-oriented limitations upon the predictive capacity of social networking sites to shape traditional media agendas over time.

Keywords: election coverage; focusing events; Granger causality; intermedia agenda setting; social media

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1. Introduction

Since the seminal agenda-setting article of McCombs and Shaw [1], much has been made of the ability of media content to inform audiences what to think about rather than what to think. As originally introduced in that study, agenda setting conceptually identified that mass media—specifically local and national newspapers, national news magazines, and national television evening news broadcasts—directly shaped the public agenda by strategically highlighting specific topics, issues, and actors in coverage over others. This process of increasing salience among media audiences, begun by McCombs and Shaw's initial inquiry of presidential campaign coverage, has now been explored across explanatory dimensions such as need for orientation [2] as well as attributes in second-level agenda setting [3]. In addition, agenda setting evidence has been reported in a wide range of national contexts across diverse issues including elections, health, crime, war, and culture, among others [4].

Yet, whether dealing with election campaigns or other topics, mass media coverage shares a common feature: limited, and necessarily hierarchical, space to address a technologically limited array of issues. Agenda setting has therefore often been positioned as a technological byproduct of the gatekeeping activities of journalists and editors. On this point, Groshek [5] wrote, "because there is only so much space on the front page of a newspaper and only so much time devoted to the news on radio and television, agenda setting is unavoidable". While the Internet and the transition of media production and audiences online has ameliorated the critical aspect of available space, the presentation order and style of reporting [6], as well as the number of stories that are covered in online channels have been shown to have agenda-setting effects [7], though measuring agendas at a broad topical level does introduce certain limitations.

At the intersection of media technologies and agendas is the well-documented shift towards a dynamic user-producer media environment [8]. Indeed, the notion of media "produsers" [9] has to some extent upended the norm of agenda setting running from mass media to the public [10,11] in a manner that conceptually resembles Entman's [12] cascading activation model. Importantly, however, this technologically engendered transformation has not only made it possible for audiences, but also editors and journalists to easily monitor the output of multiple media organizations, regardless of time and location. By some accounts, such practices have actually been linked to increasing the homogenization of both media and public agendas, rather than diversifying them [13-15].

Therefore, topics deemed important by leading media channels, sometimes regardless of geographical region, continue to identify similar—if not identical—topics across media outlets and platforms. Numerous scholars have noted the general lack of, or decline in, diversity of news content over recent decades (see, for example, Gans [16]), and Schudson wrote, "the stories one reads in one publication are likely to bear a stronger resemblance to the stories in the next publication than they would have in the past" (as cited in Boczkowski and de Santos [14]).

Considering the somewhat paradoxical confluence of these trends, this study examines the intermedia agenda-setting influence of leading mass media on leading Social Networking Sites (SNS) [17]. Specifically, coverage from the online editions of the New York Times and CNN are separately measured over time with the most frequently shared news items on Facebook and the highest-ranked trending topics on Twitter. In so doing, this study considers not only the concepts of media homogenization and user-generated content but also the reciprocity of intermedia agenda setting across professional/de-professionalized boundaries. Crucially, this study thus advances the extant literature by modeling the time-ordered effect that social media agendas, such as those found on Facebook and Twitter can have on the agendas of leading traditional media in their online formats.

In relation to this goal, which builds upon previous findings of Meraz [11] and Song [6] in identifying Weblogs and other alternative online media as shaping media and public agendas, the literature review broadly situates the current state of agenda-setting research with regard to social networking sites. Further, the review of literature examines the import of event-driven news and immediate reporting, specifically involving politics, in both mass and social media to consider the empirical evidence of reciprocity in agenda trends.

2. Agenda Setting from Mass Media through Social Media

In a recent study, Meraz [11] reported that, over time, "agenda setting has matured as a theory to include a second-level agenda-setting component (attribute agenda setting), a psychological component to explain individual-level agenda-setting effects (need for orientation), an emphasis on how the media's agenda is shaped, and an explanation for the shared news agenda among different media (intermedia agenda setting)". Still, while this theoretical approach of media effects research has been analyzed at great lengths (with 567,000 topical hits on Google Scholar reported by Bennett and Iyengar [18] in 2008), found at different levels, and codified into unique typologies, agenda setting is being transformed by the dramatic growth of audiences that are simultaneously both media users and producers, notably on social networking sites.

Indeed, agenda setting is no longer conceived of as only a top-down process from (mainstream print and broadcast) media to audiences, but also as a dynamic process where, under certain conditions, citizen re-

porting advanced in online spaces can give shape and definition to media and policy agendas among the public [19,20]. Accordingly, as Sayre and colleagues reported, "the Internet is at the center of this change, expanding the definition of news sources and news producers" [21]. Without question, the rise of the media "produser," as described by Bruns [9] has altered conceptions of where media agendas begin and end in relation to the public agenda. Considering the vast array of options for online media consumers to engage, share, and create with varying levels of commitment and intensity [22], it is clear that media agendas can now regularly intersect and cross amateur and professional boundaries [11,21,23], which introduces a reinvigorated conception of intermedia agenda setting that requires additional examination.

Historically, intermedia agenda setting has regularly been studied across various platforms, media systems, and geographical regions [4,24]. Yet, one of the most confounding results in the arena of intermedia agenda setting is the continual increase in media outlets that is set in apparent contradiction with the growing cultural and thematic homogenization of the content being presented. For example, Boczkowski and de Santos examined homogenization across Argentina's print and online newspapers and found the "intensification of online updates during the day coincides with an increase in the level of content overlap in the print and online newspapers" [14]. Similarly, Groshek examined the agendas of CNN and CNN International coverage online and found that though "there were differences in which issues were most salient on CNN and CNNI, the top three categories were the same for both: Crime, Politics, and War" [5]. Though previous research on professional intermedia agenda setting has generally found some important topical cleavages, evidence suggests that the overall and thematic differences are more subtle and becoming less distinct in what has become global media culture [25-27].

Beyond this dimension of intermedia agenda setting within and across professional media, scholars have begun to examine the spill-over [24] of online, user-generated content intersecting with the agendas of professional, traditionally offline media. In one example that employed time-series analysis [11], it was found that Weblogs contributed to setting the agendas of traditional elite media. Along these conceptual and methodological lines, Sayre et al. [21] analyzed and traced the relationships of thousands of YouTube videos and professional news media coverage of Proposition 8 (a ballot measure regarding same-sex marriage) in California. There, they reported that "YouTube was leading the charge in terms of attention to Proposition 8 in 2009" and that "online outlets such as YouTube do indeed have the potential to set the agenda independently of, and even in advance of, more professional media outlets" [21].

Another recent study compared the topical differences between the New York Times and Twitter [28], and found that Twitter was a viable source of what were considered entity-oriented topics with limited coverage in traditional media. Moreover, that study also found that "although Twitter users show relatively low interests in world news, they actively help spread news of important world events". Similarly, Kwak and colleagues [29] compared Twitter's trending topics to CNN headlines and Google trends. In their analysis, they identified that CNN was ahead in reporting more than half the time, compared to Twitter. However, Kwak et al. [29] also found evidence of what can be considered "focusing events" [30] in social media agendas, noting that "some news broke out on Twitter before CNN and they are of live broadcasting nature (e.g., sports matches and accidents)" [29].

Altogether, there is fairly clear evidence from previous studies that the SNSs can be important intermedia agenda-setting agents, particularly because of their capacity to quickly and easily share stories and break news as it occurs [21,23,28,29]. Considering the intersection of these findings with that of previous work on focusing events [30] and live-event news [31], it seems clear that agenda setting has reached a conceptual and empirical juncture [24]. Indeed, with a reinvigorated digital mythology now surrounding the ability of SNSs to alter the mix and flow of ideas in media content, this study examines two core concepts that are crucial for the future of agenda-setting research: (1) the extent to which traditional media still lead (topically and over time) the public agenda as represented in SNSs, and (2) intermedia agenda setting within and across social media, particularly with attention to focusing events, sharing media, and creating original content.

On the first of these points, Sayre and his colleagues wrote that "…the rise of new media has the potential to result in a reverse flow of information. Particularly due to the speed with which many social media outlets such as YouTube and Twitter function, they may actually have the ability to influence the agenda of traditional news outlets" [21]. Though developing for decades, this potential is now further augmented by mobile devices that have the ability to not only immediately capture but also share breaking stories through social media [32,33]. Since most social media users in many countries can much more easily access and share information through social media outlets without much editorial or governmental oversight, when compared to traditional media, SNSs are now capable of not only breaking stories first but also building and setting traditional media agendas.

Yet when considering the different uses that are made of social networking sites, there is vastly less clarity on the extent to which certain social media lead (or follow) the agendas *within* other online social channels. While it is certainly not unusual for individuals to maintain active accounts on Twitter and Facebook, as well as to visit YouTube, Wikipedia, or any

other online social media, the ways in which the residual content activity across different SNSs relates in terms of agendas has been understudied. Previous research typically focuses on only one social network site in relation to one traditional media outlet, and this practice has led to some conclusions where social media in general is treated as monolithic in its agenda-setting capacity [34]. Attention has also often only been given to one issue across agendas over time [11,21] or a comparison of topics over both social and traditional media agendas [28,29].

The study reported here has begun to close some of these gaps by first considering the topical agendas of two leading traditional media outlets (the New York Times and CNN) as well as the most common shared stories and trending topics on two popular SNSs (Facebook and Twitter). Time-series analyses have then been applied to the most prominent topics to track intermedia agenda setting across all outlets over time. This study is thus positioned to determine to what extent traditional media sets the agenda for social media, as well as the limits of reciprocity for the public's media agenda through SNSs to enter into the traditional media agenda. In addition, this study begins to compare intermedia agenda setting topically and across time within SNSs, and in so doing, adds a vital understanding of where traditional media, online uses, and content intersect around instances of focusing events, particularly elections.

This study thus examines four separate media agendas over a period of six weeks that strategically includes the 2010 US Midterm Election as an established focusing event. The influence of two distinct social media agendas and the underlying assumptions of media "produsage" [9] therein are thus examined against the flow of topics and investigation of subjects in traditional media. The following research questions were posed to examine reciprocity and the predictive capacity of SNSs in intermedia agenda setting.

3. Research Questions

RQ1: Which topics are made most salient in traditional media coverage, and which topics are made most salient on social networking sites?
RQ2a: Are there significant similarities between the topical agendas of traditional media channels and the agendas on social networking sites?
RQ2b: Are there significant similarities within the topical agendas on social networking sites?
RQ3a: On the most salient topics, do traditional media channels set the agendas for social networking sites?
RQ3b: On the most salient topics, do social networking sites set the agendas for traditional media channels?
RQ3c: On the most salient topics, does one social network site set the agenda for another social network site?

4. Method

The units of analysis in this study were headlines and trending items. The rationale for using these features to determine agendas is one that has been applied previously [5,28]. In addition, this analytical approach is also based on a rich background of work noting the critical importance of front matter, and headlines in particular, in attracting audience attention and facilitating shorthand interpretations of issues [35,36]. Though the distinction can be somewhat controversial in a converged media environment, for the purposes of this study, "traditional" media were represented by the New York Times and CNN. "Social" media, otherwise hypothesized as social networking sites, were represented here by two of the largest and most active, Facebook and Twitter.

The study thus began by collecting the top stories from the New York Times, CNN, Twitter, and Facebook for a period of six weeks in the fall of 2010 (11 October 2010 to 24 November 2010) to examine the research questions posed. The 2010 US Midterm Election of 2 November 2010 was specifically situated at the exact midpoint of this data collection period in order to observe coverage in various media around a known focusing event [37]. At randomly selected intervals (morning, afternoon, evening, early morning) each day during this timeframe, the online editions of the NYT [38] and CNN [39] were simultaneously captured, along with the most trended topics on Twitter and the most frequently shared stories on Facebook.

Trending topics from Twitter were gathered from http://whatthetrend.com [40] and filtered to only include the leading ten trending topic in the USA per day. Though unofficial, whatthetrend.com is self-defined as "the front page of the real-time web" and was particularly useful to categorize trends because for each trend, a brief audience-generated synopsis explains why it is trending. Most-shared stories on Facebook were pulled from http://itstrending.com [41] and limited to the eight most frequently shared headlines reported there [42]. In order to form more even comparisons with the news organizations NYT and CNN, items were filtered by the "News" categorization there. Though not officially endorsed by Facebook, itstrending.com operated by collecting all of the content shared via the Facebook Open Graph API and ranked each story, with complete headlines and original media outlet, solely by the number of times it was shared.

As with previous intermedia agenda-setting research [5], this study focused on what amounted to the "front pages" of the NYT and CNN online, which were subject to regular updating and had a clear hierarchy of most important items. These agendas were coded and then compared with more conceptual agendas of Twitter and Facebook that were determined by public activity in discussing or sharing certain topics within those spaces. Coding was completed by an individual trained in the categorical definitions with

previous experience in content analysis. Preliminary coding was used to develop operational definitions for each category, minimize disagreements, and expand the codebook to include a "media" category. Following these negotiations, the coder independently made coding decisions for all of the headlines and trending topics in the sample.

The headlines and topics from each media outlet were categorized into one of 17 possible categories in an adapted codebook used previously in separate publications by Natarajan and Xiaoming [26] and Groshek [5]. The categories in these codebooks were: (1) Accidents/natural disasters, (2) Agriculture, (3) Business/economics, (4) Crime/criminal justice/law and order, (5) Ecology/environment, (6) Education, (7) Health care, (8) Military/national defense, (9) Politics, (10) Race/religion/culture, (11) Social problems/services, (12) Sports, (13) Technology, (14) War/terrorism, (15) Oddities, and (16) Undecided.

As already noted, this study added a (17) Media category. This decision was the result of preliminary coding that quickly revealed a regular amount of coverage about developments in media (i.e., Facebook, Twitter, YouTube, and other social media) or coverage of other topics in media, such as video games or forms of citizen journalism. Since this coverage did not fit neatly into existing categories—the "Technology" category, for example, was more about innovations such as new devices rather than media covering other media or media uses—the codebook was expanded on these grounds.

The reliability of the primary coder was determined by a second individual, otherwise uninvolved in the study, who coded a randomly selected 17.7% of the sample. Following some practice coding and a training session, intercoder reliability was 0.78 when calculated using Cohen's Kappa. Though coding was thus not free from error, and trending items on Twitter required additional training for both coders, this level of reliability with a measure that accounts for chance agreement was well above the minimum level of 0.70 indicated by Frey, Botan, and Kreps [43].

Once coded, the media agendas of these four outlets were determined by level of topic (category) salience and then rank-ordered, time-lagged, and compared to one another. Two key statistical techniques were applied to answer the research questions posed here. The first is a fairly common correlational measure of agreement among ordinal rankings, Spearman's rho, which is based on frequency of topical categories across media outlets. This ranking was derived simply by the number of times a headline topic was coded for each media outlet. For example, culture was the most common topic of headline coverage on CNN by raw frequency, with 103 instances (22.9%) and for each media outlet, categories were ranked by frequency of appearance and then those rankings were compared across outlets for correlational association with Spearman's rho, which is a routine appropriate for such ordinal-level measures.

The second—Granger causality testing—is a time-series analytical technique that has been growing in prominence in communication research, particularly with attention to agenda setting [11,21,44,45]. Though now discussed fairly regularly in literature, Granger causality calculates a significance test for measuring if the time lags of one variable (in this case, topic salience in a media outlet) relate to the distribution of another variable (here, topic salience in another media outlet) over time. Put somewhat briefly, Granger causality in intermedia agenda setting occurs when the distribution of topic salience in one media outlet explain a significant amount of variance of topic salience distribution in another media outlet, above the variance that can explained by endogenous topic salience time lags [46]. Compared to other time-ordered techniques, such as time-lagged correlations, and VAR or ARIMA modeling, Granger causality testing has been argued to be more accurate and provide clearer evidence of time-order relationships [11,47]. In other words, this technique can statistically determine when topic salience in one media agenda *precedes* and *predictively explains* topic salience in another media agenda.

In order for Granger causality testing to be effective, however, several conditions must be considered. Data streams must have a minimum of 40 unique observations [48]; the six weeks of daily data coded for this study suitably has 45 instances. Variables must also achieve stationarity [49] to safeguard statistical validity; here, augmented Dickey-Fuller tests were conducted for each variable considered. All variables for each media outlet were uniformly transformed with a natural logarithm and all achieved stationarity. Finally, in Granger causality tests, an appropriate time lag must be selected. Though there is no conventional standard for determining time lags, most research relies on statistical criteria [50] derived for this purpose. This study utilized a minimum lag of one unit, which is required for Granger causality testing, and otherwise applied the most-identified suggested lag length across all lag criteria.

Of course, though Granger causality tests identify statistically significant time-ordered relationships between dyadic media agendas, they do not prove real-world causation [51,21]. Together with topical measures of media agendas, though, these analyses are very well suited to precisely examine reciprocity in intermedia agenda setting, specifically considering the predictive role of unique social networking sites.

5. Findings

1710 items were gathered over the six-week time frame identified here. Each headline and trending item was coded into only one of the categories from the codebook. For practical purposes, the lowest five categories accounted for no more than 1.6% of total units analyzed. These categories (Military, Social Problems, Education, Undecided, and Agriculture) were

thus grouped together into a generic "Other" category that was not explicitly considered in terms of rank-ordering.

The first research question examined which topics are made most salient in traditional media coverage and which topics are made most salient on social networking sites. Table 1 summarizes the results observed here, where for CNN, NYT, and Facebook, the four most salient topics by category were: Culture, Politics, Crime, and Business. Though there was some variation across these media in terms of ranking the prominence of news items—bearing in mind that only the most shared news items on Facebook were tracked—a relatively high degree of similarity in topical agendas can be observed here between not only two traditional news agencies but also one social network site, Facebook.

Twitter, the other social network site considered in this study, demonstrated a much different agenda of most salient items. Specifically, the four most frequently identified categories on Twitter were (in order): Culture, Oddities, Sports, and Media. Thus, the topics made most salient varied across traditional to social media, at least with respect to the most talked-about trending topics on Twitter. Table 1 summarizes the rank-order of all topics by media outlet and the topical discrepancies there, most notably with regard to Twitter from all other outlets, can be readily observed.

Along these lines, RQ2a examined if there were significant similarities between the topical agendas of traditional media channels and the agendas on social networking sites. Here, it can be observed that the topical agendas of CNN and Facebook are highly correlated ($p = 0.85$, $p < 0.01$). When also measured with Spearman's rho, the New York Times' topical agenda is moderately correlated to that of the most frequently shared news stories on Facebook ($p = 0.64$, $p < 0.05$). Based on the findings shown in Table 1, it is somewhat unsurprising to observe that the agenda of most popular trending topics on Twitter were not correlated with the agendas of either traditional media outlet. There was also no statistically significant relationship between the topical agendas of Facebook news shares and Twitter trending topics.

Thus, when considering RQ2a, there were differential relationships between traditional media and the two SNSs examined here. There was a fairly strong correlation between the topical agendas of both traditional media outlets and that of Facebook, but no relationship between any traditional media agenda modeled here and trending topics on Twitter. Likewise, analysis of RQ2b found no significant similarities within the topical agendas on the social networking sites Facebook and Twitter. In other words, the topical agenda of most trending items on Twitter were unrelated to any other media outlet over the time period analyzed here. Though not explicitly posed as a research question, it is worth reporting a moderately strong relationship ($p = 0.68$, $p < 0.05$) between the topical agendas of the NYT and CNN. These results are summarized in Table 2.

Table 1. Issue salience by topical category in coverage on CNN, New York Times, Twitter and Facebook.

Category	CNN Rank	CNN %	NYT Rank	NYT %	Twitter Rank	Twitter %	FB Rank	FB %
Culture	*1*	22.90	*4*	7.10	*1*	41.30	*2*	15.60
Politics	*2*	17.30	*1*	28.70	5	4.90	*1*	22.80
Crime	*3*	9.30	*3*	7.30	9	1.10	*4*	7.80
Business	*4*	7.10	*2*	20.20	8	1.60	*3*	9.70
Accidents	5	6.90	6	5.10	7	2.70	8	3.90
Media	6	5.80	9	3.10	*4*	5.30	5	7.20
Health care	7	5.60	8	4.00	11	0.70	6	6.70
Oddities	8	4.00	12	1.10	*2*	18.70	7	6.40
Technology	8	4.00	11	1.30	6	3.60	12	1.10
Terrorism	10	3.60	5	6.90	9	1.10	10	3.60
Sports	11	3.30	7	4.40	*3*	14.40	10	3.60
Environment	11	3.30	10	2.40	11	0.70	8	3.90
Others	13	6.90	13	8.20	13	4.00	13	7.80
Total		100%		100%		100%		100%

Note: The four most frequent categories' rank order by media outlet appear in italics.

Table 2. Bivariate Spearman's rho correlation matrix for issue salience by topical category in coverage on CNN, New York Times, Twitter and Facebook.

	CNN	NYT	Twitter	Facebook
CNN	--			
NYT	0.68*	--		
Twitter	0.24	-0.07	--	
Facebook	0.85**	0.64*	0.18	--

*p < 0.05, ** p ≤ 0.01

After considering the topical agendas of these traditional and social media outlets, this inquiry then proceeded to examine intermedia agenda setting of the most salient topics across different media outlets over time. To begin, RQ3a considered whether traditional media channels set the agendas for social networking sites on the most salient topics. The categories "Politics" and "Culture" were analyzed further as these were, on average, the two most prominent categories across all four media.

When looking at the distribution of political coverage over time, it can be observed that the frequency of political coverage on the New York Times Granger-caused political coverage ($\chi2 = 4.35$, $p = 0.02$) on Twitter trending topics over time. In addition, the political coverage on CNN was shown to have Granger-caused (also with lags of two days) political coverage on Twitter, but only at $p < 0.10$ ($\chi2 = 2.57$, $p = 0.09$). In terms of political coverage, there were no significant Granger-causal relationships between traditional media and Facebook over time. Though not explicitly entered as a research question, it is worth reporting that political coverage on the NYT Granger-caused ($\chi2= 3.65$, $p = 0.036$) the frequency of CNN's political coverage over time.

In examining coverage of culture, the frequency of such coverage on CNN was shown to have Granger-caused (with a lag of one day) cultural stories shared on Facebook ($\chi2 = 5.78$, $p < 0.05$). Likewise, the New York Times' cultural coverage frequency also Granger-caused this category of coverage ($\chi2 = 3.55$, $p = 0.07$) on Facebook but only at the $p < 0.10$ threshold. There were no instances where the amount of cultural coverage in traditional media coverage was shown to have Granger-caused cultural trending items on Twitter, even though such coverage was the most regular type of coverage on Twitter by far.

Altogether, it can thus be observed that there are still fairly clear intermedia agenda-setting effects of traditional media on social networking sites, but that influence is not uniform across topics or the social media channels of Facebook and Twitter. Somewhat surprisingly, although uncorrelated topically across agendas, politics on Twitter was Granger-caused by both NYT and CNN political coverage as distributed over time. On the other hand, though Facebook was significantly correlated topically to traditional media agendas, its political coverage was not Granger-caused by either traditional network over time. However, cultural coverage on Facebook was actually Granger-caused by the frequency of such coverage in both the Times and on CNN.

As shown in Figures 1 and 2, there are clear differences in the distributions of political and cultural coverage over time and across media. Political coverage centers on a focusing event—the election of 2 November 2010—that appears to have shaped the frequency of coverage overall, but particularly on Twitter where almost no political coverage was observed before this date. Cultural coverage, on the other hand, followed a seemingly more regular cycle of coverage, such that the intermedia agenda-setting influence of traditional media could be observed only on Facebook.

The next research question (RQ3b) was posed to determine the extent to which social networking sites set the agendas for traditional media channels on the most salient topics. The two most dominant categories of coverage, politics and culture, were again modeled but in this case to measure potential reciprocity in intermedia agenda setting. Here, when looking at political coverage, Twitter (with a one-day lag) nearly Granger-caused politics coverage ($\chi2 = 2.32$, $p = 0.11$) on CNN, but only at a very generous level of statistical significance. There were no other predictive relationships regarding political coverage originating from SNSs to traditional media that approached statistical significance. Once more, though Facebook was more topically related to the agendas of both the New York Times and CNN, when analyzing the frequency of political stories shared on Facebook over time, there were no Granger-causal relationships that predicted political coverage in the NYT or on CNN.

When considering cultural coverage and the ability of social networking sites to set the agenda of traditional media over time, the frequency of cultural trending topics on Twitter did Granger-cause ($\chi2 = 6.11$, $p \leq 0.05$) cultural coverage on CNN. No statistically significant relationships could be observed with the New York Times' coverage of cultural topics. The distribution of cultural news topics on Facebook was again unrelated, in the Granger-causal sense, to either traditional media outlet.

The intermedia agenda-setting effect of social networking sites during this period and across these media thus appears much more limited than that of traditional media [52], even as large numbers of users around the world create and share content through SNSs. In this study at least, there was only clear evidence that social media influenced the agenda of traditional media in the case of cultural trending topics on Twitter having Granger-caused cultural coverage on CNN. While Twitter also neared significance in Granger-causing political coverage on CNN, the distribution of cultural and political coverage in the New York Times was untouched by the amount of such coverage over time on the social networking sites studied here. The most frequently shared stories about these topics on Facebook had no predictive causal-type relationships whatsoever.

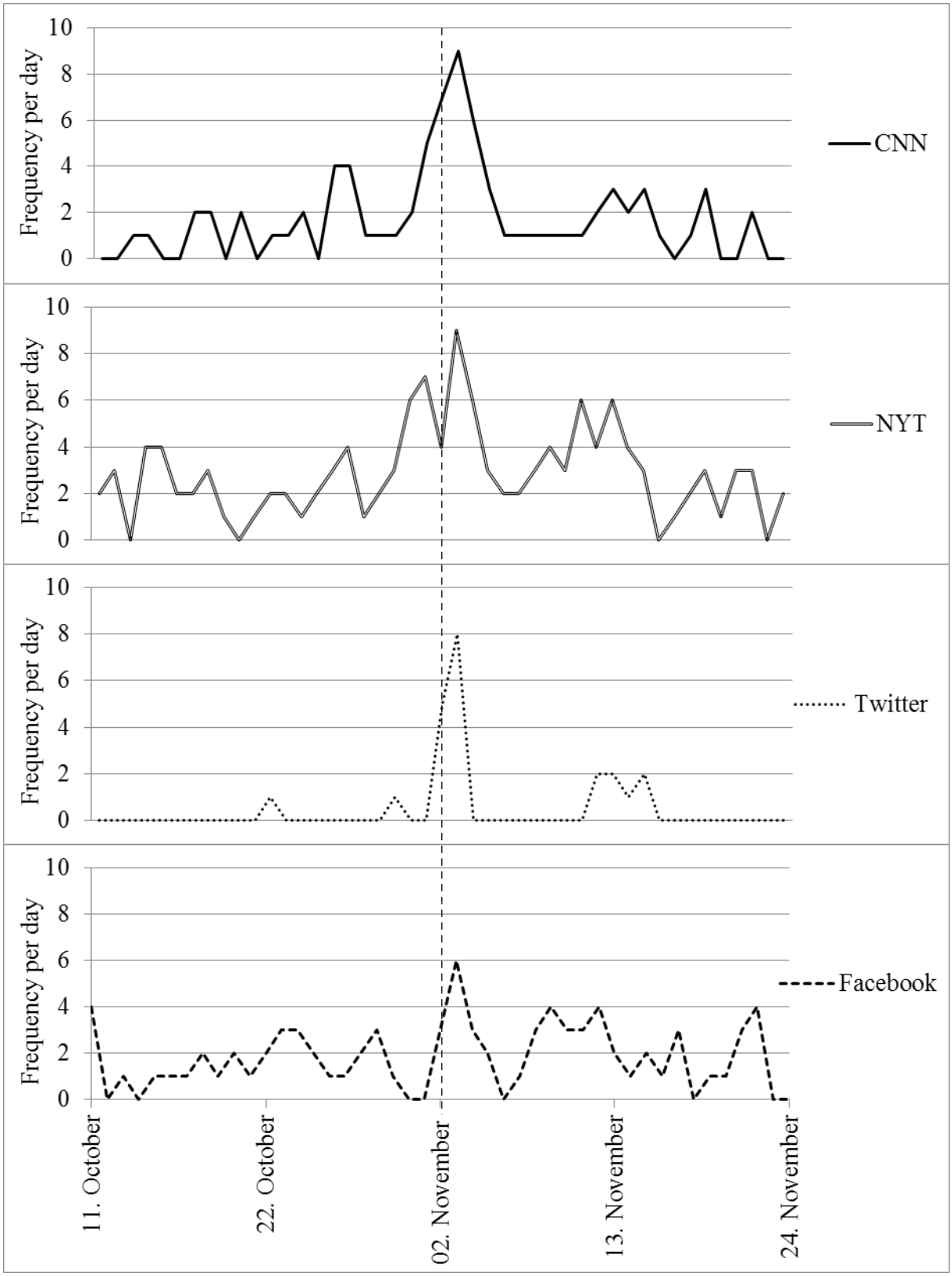

Figure 1. Political coverage over time across traditional media and social networking sites. Note: 2 November was the date of the 2010 US Midterm Elections.

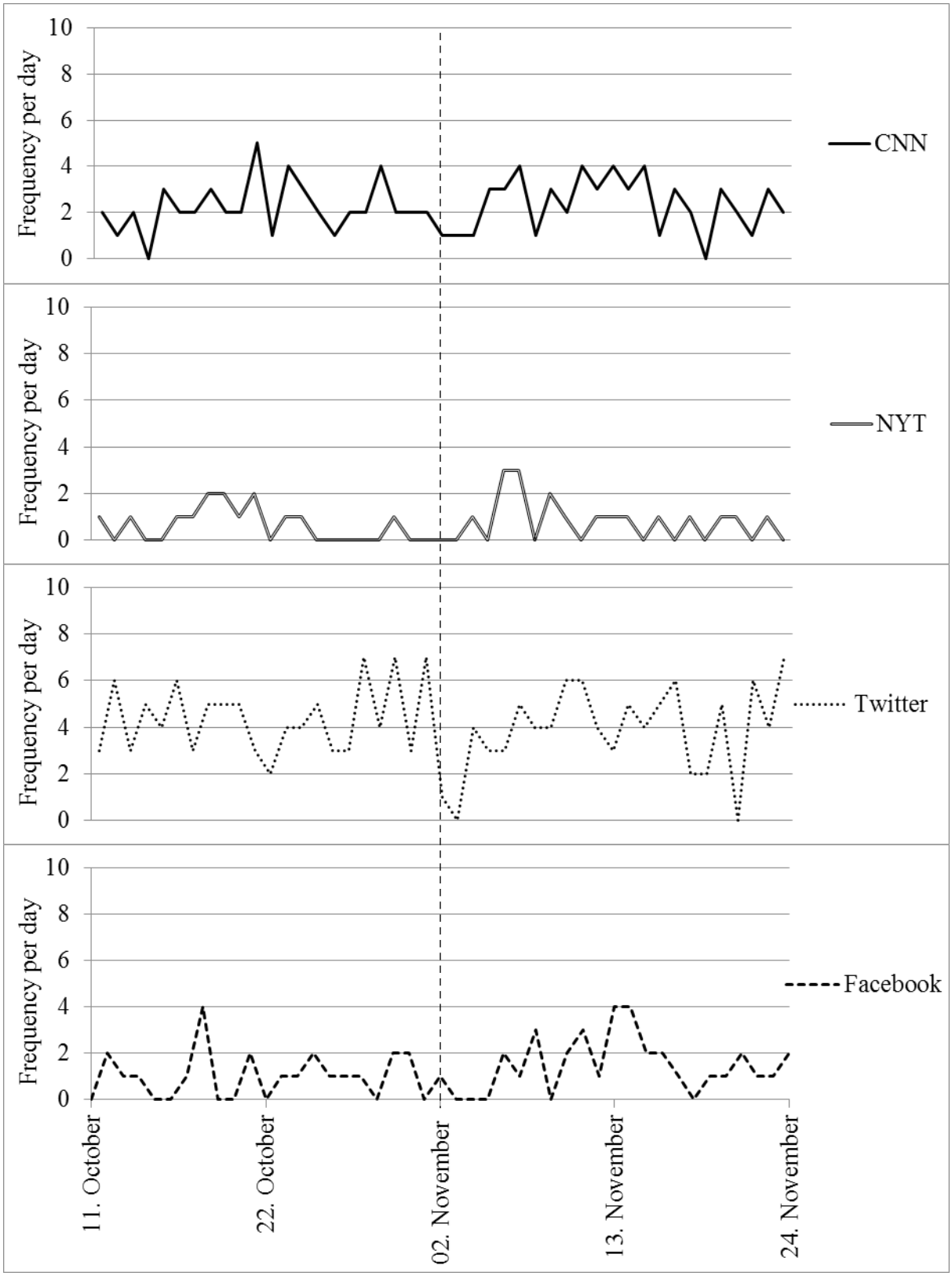

Figure 2. Cultural coverage over time across traditional media and social networking sites. Note: 2 November was the date of the 2010 US Midterm Elections.

Further, when examining the last research question, there were no statistically significant Granger-causal relationships observed for political and cultural coverage within the social media analyzed in this study. RQ3c queried whether, on the most salient topics, one social networking site sets the agenda for another social networking site? Based on analyses performed here, the answer to that question is no—and there are by and large no topical or time-ordered relationships that can be observed within the agendas and the intermedia agenda-setting functions of social networks sites in this sample. The findings of all Granger causality testing are summarized in Table 3.

Table 3. Significant intermedia Granger-causal relationships in political and cultural coverage distributions across media.

Granger Relationship	Political Coverage	Cultural Coverage
CNN → Twitter	2.57#	--
CNN → Facebook	--	5.78*
NYT → Twitter	4.35*	--
NYT → Facebook	--	3.55#
CNN → NYT	--	--
NYT → CNN	3.65*	--
Twitter → CNN	2.32+	6.11*
Twitter → NYT	--	--
Facebook → CNN	--	--
Facebook → NYT	--	--
Twitter → Facebook	--	--
Facebook → Twitter	--	--

*p < 0.05, #p < 0.10, +p < 0.15

6. Conclusions

During the timeframe and with the media analyzed here, it is evident that the public agenda—as manifest in trends and shares on social networking sites—has not yet come to drastically alter agendas of traditional media in a regularly predictive manner. While the distance from editors and journalists as gatekeepers of news and information flows to the public has clearly diminished with the popularization of social media [53,54], it seems the potential for SNSs to directly shape media agendas does exist but only sporadically and on certain topics. Considering that different online media platforms, from blogs to various forms of social media—in this case Facebook and Twitter—allow for certain affordances and restrictions, it is reasonable to find that each platform demonstrated differential intermedia agenda setting potential as leveraged by the sociotechnical nature of its architecture.

The outward goals of this study were to more broadly examine intermedia agenda setting across topics and over time to examine if, and to what extent, different social networking sites could lead, rather than follow, the agendas of traditional media. To answer simply, yes, it is possible that a social networking site (Twitter) can predictively explain cultural coverage in a traditional media outlet (CNN), but apart from that finding, there is little concrete evidence of social media upending the shape and flow of news agendas. Indeed, as summarized in Table 3, there remains palpable evidence of traditional media setting the agenda in terms of both what was shared (Facebook) and what was created (Twitter) in social media spaces, though the level of measurement at the headline and categorical level does introduce limitations upon the analysis and its application to agenda setting at a finer gradation.

Still, while these findings are somewhat at odds with other research [11,21,28,29], these other studies each often considered just one form of social media (commonly Twitter or YouTube) or focused on just one particular topic over time. The study reported here expands the scope of study and makes a useful contribution by identifying both topics that generate the most attention and become most salient in social networking sites, as well as making comparisons of intermedia agenda setting between multiple traditional media outlets and within social media. Results observed here indicate that not all social media are created equal with regard to both agendas and influence—but also that events, particularly the ones that can be predicted, like elections, are especially pertinent in shaping social media agendas.

In particular, findings from this study suggest that topically, Facebook is relatively strongly related to both CNN and the NYT in terms of topic salience. Comparatively, trending topics on Twitter are not significantly related to the topical agendas of either traditional media or another social media outlet. Yet, when set in a predictive capacity on *specific* topics, trending topics on Twitter can actually precede and help explain traditional media (CNN) coverage of culture—and nearly show the same relationship (where $p = 0.11$) with political coverage (again on CNN). The distribution of most frequently shared political and cultural stories on Facebook, however, did not show any predictive Granger-causal relationships over time, despite being far more closely related to the topical agendas of both traditional media outlets examined here.

Thus, while there is a tendency in both popular and academic literature toward grouping social networking sites as somewhat similar entities in terms of their transformative effect [55,56], it is worth noting the activities and uses that take shape in these spaces can be much different [22]. These unique uses can, of course, lead to unanticipated outcomes [13,14,51], particularly with regard to agenda setting. While there is good reason to note the growing import and influence of user-generated culture across media industries, caution should also be exercised to delimit forms of social media uses, often structured by the social networking sites themselves to make better sense in tracking the influence each does or can have in larger online or offline settings [57].

On the other hand, traditional media more consist-

ently set the agendas in time-ordered Granger-causal capacity for both Twitter and Facebook. Somewhat interestingly, these relationships were also bound to certain social networking sites by topics. Political trending topics were Granger-caused by traditional media on Twitter and shared cultural stories were Granger-caused by traditional media on Facebook. Parsing out exactly which casual mechanism explains these findings of why one and not the other is difficult and not readily apparent by looking at content alone. Other scholars, such as Huberman, Romero, and Wu [58] have identified proximity and anonymity as important features that discriminate uses of online media, and Kwak, Lee, Park and Moon [29] found that less reciprocity between users functionally situates Twitter as closer to mass media in that relatively few senders produce most of the news for an audience of followers.

Altogether, while the precise rationale for why politics on Twitter and culture on Facebook were Granger-caused by traditional media is not readily apparent, these results nonetheless clearly suggest that intermedia agenda setting needs to be considered in more circumspect terms—directionally, topically, and with respect to precisely identified media outlets. As the results of this study further indicate, it is certainly important to consider social media in intermedia agenda-setting processes because certain social networking sites have the potential to shape elite agendas, and in this study cultural coverage on Twitter was shown to Granger-cause cultural coverage on CNN. We generally characterize this outcome as *agenda trending* and it suggests that social media trends can, indeed, set traditional media agendas. Yet while the findings noted here suggest that agenda trending is taking place, it seems only at cetain moments where the impact of social media can key in to focus on an event [59].

While it is speculative as to why cultural coverage on CNN was predicted by cultural coverage Twitter and cultural coverage on the NY Times was not, one potential explanation may be the regular integration of Twitter in particular on normal CNN broadcast coverage, which is a feature certainly less shared by the NYT. Notably, the content patterns observed in the agendas of social media were shown here to have been informed by those very same elite agendas, or likewise to extend the agendas of traditional media further.

In this study, the 2010 US Midterm Elections was situated within data collection as an expected, fixed focusing event. Under this circumstance, traditional media was shown to have primarily led social media coverage of politics, with the exception of Twitter trends showing a very limited ($p < 0.15$) Granger-causal relationship to political coverage on CNN. On balance, the importance of focusing events—whether previously identifiable or emergent, as in the case of cultural coverage on Twitter—seems to be a key feature of intermedia agenda setting that has been somewhat overlooked in previous literature [60,61]. As shown here, patterns of agenda reinforcement with relatively limited reciprocity and innovation can still be observed in the contemporary user-producer media environment.

While some scholars [10] have suggested the end of agenda setting may be in sight, this study offers some empirical evidence of the adaptability and amplification of traditional media agendas through the public in social media trends. In addition, findings presented here signal the reciprocal capacity of social media in intermedia agenda setting, specifically in instances where topical similarities are limited. These findings also identify a pressing need for further specificity in not only clarifying intermedia agenda-setting flows through certain social media, but also additional attention to focusing events and their topics that may well facilitate more evenly reciprocal agenda-setting processes, such as those described by Meraz [11]. Although the results reported here do not precisely align with previous work on blogs, they do not necessarily conflict, and rather work to extend and add nuance to the conceptualization of SNSs as the next iteration of online media that may well contribute to a shaping of traditional media agendas as the field of gatekeepers continues to widen by producers and deepen by influence.

Practically speaking, the differential levels of agenda-setting influence observed here suggest Twitter is more likely to follow, rather than lead, political agendas formed by traditional media and cultural coverage on Facebook is more clearly set by agendas on traditional media. Conversely, cultural coverage on Twitter was the one category of coverage where a social media channel set the agenda for a traditional one, in this case CNN. On a theoretical level, these findings open up a space where agendas must be considered not only topically—where there may be little apparent relationship—but also temporally, where within-topic flows may suggest greater agenda-setting reciprocity over time and across channels. Considered jointly, the outcomes of this study consequently identify that the nature, structure, uses, and content of Facebook and Twitter are unique but still compatible and possibly complementary in the public arena, particularly as each is differently shaped and potentially shaping traditional media agendas.

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Research Article

Predicting Social Networking Site Use and Online Communication Practices among Adolescents: The Role of Access and Device Ownership

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Abstract: Given adolescents' heavy social media use, this study examined a number of predictors of adolescent social media use, as well as predictors of online communication practices. Using data collected from a national sample of 467 adolescents between the ages of 13 and 17, results indicate that demographics, technology access, and technology ownership are related to social media use and communication practices. Specifically, females log onto and use more constructive communication practices on Facebook compared to males. Additionally, adolescents who own smartphones engage in more constructive online communication practices than those who share regular cell phones or those who do not have access to a cell phone. Overall, results imply that ownership of mobile technologies, such as smartphones and iPads, may be more predictive of social networking site use and online communication practices than general ownership of technology.

Keywords: adolescents; cell phones; demographics; Facebook; Internet-capable mobile devices; online communication practices; predictors; social networking sites

1. Introduction

There is little question that adolescents are the leaders of a growing trend to use social media in high quantities and on a daily basis [1-4]. Recent studies examining adolescent Internet use have found that more than 90% of all 12–17 year-olds use the Internet and 73% of adolescent Internet users spend time on social networking sites, an increase of nearly 20% since 2006 [3]. While use of other social networking sites is up from years past, a far smaller percentage of

online adolescents (24%) use Twitter compared to sites like Facebook [3]. Additionally, research by Beasley and Conway [5] found that a majority (59%) of adolescents aged 8 to 17 check their Facebook profile page more than twice daily, compared to just 20% of adult users over the age of 18. Although a majority of the research referenced in this paper refers to research conducted in the United States, it must be noted that Facebook is international in scope and is popular among adolescents throughout the world [6,7], becoming an important part of adolescents' daily lives, and changing the way that they communicate and interact with their friends and acquaintances [8].

Overall then, a large majority of adolescents are using social media, especially Facebook, in relatively high quantities and multiple times each day. Based on this research, it is clear that the percentage of users is growing as social media use becomes more ubiquitous among adolescents. As a result, this study seeks to examine the predictors of social networking site use among adolescent users with a focus on the specific ways in which adolescents communicate and interact on these sites. We will utilize Uses and Gratifications as a framework for understanding how adolescents select and use communication technologies. Additionally, we will examine predictors of constructive and non-constructive communication, defined as communication practices in which the adolescent either creates the communication (constructive), such as by posting a new status update, or receives the communication (non-constructive), such as by reading a friend's wall post. Online communication has been cited as a mechanism for understanding the effects of social networking site use on adolescents [9]; therefore, it is important to understand demographic, access, and ownership predictors of such communication.

2. Social Networking Sites

2.1. Effects

With the growth in popularity of social media sites, multiple studies have explored the effects of social networking site use. For example, studies by Valkenburg and colleagues have demonstrated positive effects of social networking site use, such as helping adolescents explore their identity [9], increasing connections with others [9], and increasing users' self-esteem by increasing the number of relationships formed on the site and the number of comments received [10]. Finally, recent research demonstrates that adolescents themselves indicate that social networking site use is more likely to have a positive effect than a negative effect on their social and emotional lives [11]. Conversely, research indicates that there are potential risks for users of social networking sites as well. Research has demonstrated that youth may self-disclose intimate information [12] which is of particular concern, given that online self-disclosure is related to the posting of personally-identifying information [13]. For example, research by Barbosa and colleagues [14] found that, among European and Brazilian adolescents, a large number of individuals reported posting information such as their full name, a photo of their face, their school, and even their address. Additionally, Peter, Valkenburg, and Schouten [15] found that early adolescents (ages 12 to 14) were more likely to contact and communicate with a stranger using social media when compared to older adolescents.

2.2. Use

While other forms of social media, such as Twitter, do allow users to create profiles with a great amount of information, Facebook provides perhaps the greatest opportunity for doing so. Recent reports have indicated that adolescents have begun to split their social networking time across a number of different sites, such as Facebook, Twitter, and Tumblr [4]. It is important to note, however, that Facebook remains the most used social networking site for the majority of adolescents [4].

Overall, Facebook allows users to create and monitor a profile, controlling the personal information that others can see on their profiles. This is important, especially to adolescents, given the great significance that interpersonal relationships hold during this developmental stage. After all, during adolescence, children attempt to maintain close ties to similar others in an effort to deal with increasing separation from their parents [16]. Social media sites, such as Facebook, allow users to maintain relatively close ties to friends, family, and acquaintances, thereby alleviating the fear of losing relationships. Additionally, Facebook provides users with tools that allow them to change their profiles quickly and easily. Therefore, it is possible for Facebook users to post information that could allow them to explore their identity and connect with others, two positive effects of social media that have been identified in the literature [9,17]. It is also likely, however, that Facebook users can use the options available to post potentially sensitive information. Although social networking sites, such as Facebook, do have privacy protections available that are used by a growing majority of adolescent Facebook users [18, 19], there are still users whose profiles are available to the entire Facebook community.

3. Current Study

Given the mixed findings of both positive and negative effects of social media site use on children and adolescents, and with social network use reaching near ubiquitity with adolescent users, it is important that researchers explore the ways in which adolescents are using the features of social networking sites as a way of communicating and interacting with their peers. After all, it is these online communication practices

that are generally cited as the mechanism by which both positive and negative effects occur [9]. While there is a large and growing body of research on the effects of social media use among adolescents, less research has systematically looked at predictors of social media use among this age group, especially the ways teens communicate and interact online. Therefore, in the present study, we will first examine the pattern of relationships between adolescent demographics, access to technology, technology ownership, and overall social media usage. Next, these predictors (demographics, access to technology, and technology ownership) will be used to examine specific Facebook posting and communication practices including constructive and non-constructive communication practices.

4. Predictors of Social Media Use

4.1. Ethnicity

There has been consistent evidence of race and ethnicity differences in overall media use over the years. Most recently, reports indicate significant differences in the amount of time youth ages 8 to 18 years old spend using media as a function of race [20,21]. While these numbers appear to exist for traditional media like television and computers, we know very little about the race or ethnicity differences in social networking site use. Recent data indicates no differences in teen Facebook use by race, but significantly more Black youth use Twitter than either White or Hispanic Youth [4]. Given the historical differences in media use as a function of ethnicity, we control for ethnicity in many analyses in this study.

4.2. Gender

Regarding the overall use of social media sites, nationwide representative surveys of adolescents have generally found that a greater percentage of females had an online profile when compared to males. For example, Lenhart [1] found that 86% of surveyed females aged 15 to 17 reported having some type of online profile, compared to just 69% of males in that same age range. In addition, research by Beasley and Conway [5] found that females aged 13 to 17 spend more time using social networking sites and log into them more than males do each day. Specifically, 25% of surveyed females reported checking their online profiles more than 5 times each day, double the percentage of males who reported doing so. Finally, using a slightly older sample (18 to 19 year-olds) Hargittai [20] found that females represented a majority of social media users across four platforms: Facebook, MySpace, Xanga, and Friendster, although these were not always significant differences. Based on this body of research,

H1a: in the present sample, females will log onto social networking sites more frequently than males.

Concerning the type of communication practices used by males and females on social networking sites, research has also indicated some differences based on gender. For instance, Rosenberg and Egbert [22] found that females were more likely to work towards achieving a number of goals on Facebook. For example, females were more likely to experiment with their online identity and the ways in which they interacted with others, working towards achieving a fuller sense of their identity and closer relationships with others [22]. According to the authors, these goals help to shape the planning of a message, as individuals focus on increasing and maintaining attention and emotional support. Additionally, these goals led to individuals thinking about their self-concept and therefore, engaging in social comparison [22]. In order to achieve these goals, it is likely that users would need to engage in more constructive communication strategies, in order to post information that can potentially increase others' attention to their profiles and their own sense of identity.

Additionally, Valkenburg and Peter [12] found that girls aged 12 to 18 were more likely to be socially anxious than boys, in general. Further, socially anxious respondents were more likely to use the Internet and social networking sites for intimate self-disclosure. Again, it seems likely that constructive communication practices, such as posting new photos, updating one's status, or posting on a friend's wall, would need to be used for intimate self-disclosure. While these constructs, such as emotional support, social anxiety, and self-disclosure, are rather disparate, it is important to note that constructive communication practices could be used by adolescents to achieve feelings of emotional support from others, reduce social anxiety, and increase their self-disclosure. The relationship between gender and non-constructive communication is unclear, however. Therefore,

H1b: in the present sample, controlling for age and ethnicity, females will be more likely to engage in constructive communication practices on social networking sites than males.

RQ1: controlling for age and ethnicity, what is the relationship between gender and non-constructive communication practices?

4.3. Age

Similar to the relationship between gender and social media use, the body of research on the relationship between age and social media use is generally consistent with social media use increasing with age during adolescence and early adulthood. For example, Lenhart and colleagues [3] found that, while over 80% of online teens aged 14–17 used social media sites, just over 50% of online teens aged 12 to 13 did so. Further research by Beasley and Conway [5] indicated a similar finding, with nearly 70% of 13–17 year-old respondents reporting using social media com-

pared to just 30% of 8-12 year olds. Thus,

H2: controlling for gender and ethnicity, age will be positively related to the number of social media log-ins per day.

In terms of specific communication practices on social networking sites, research by Valkenburg and Peter [12] indicated a curvilinear relationship between age and online self-disclosure, such that 15 year-olds were the most likely to engage in such behavior when compared to younger and older adolescents. While a number of other large-scale surveys have measured these practices [1,3,5] few have examined the relationship with age, making this body of research less clear. Therefore,

RQ2: controlling for gender and ethnicity, what is the pattern of relationships between age (13–15 year-olds vs. 16–17 year-olds) and communication practices (both constructive and non-constructive) on social networking sites?

4.4. Access to Technology and Ownership

In addition to demographics, it seems highly likely that access to technology and ownership would be related to both the overall use of social networking sites and the types of communication practices employed by adolescent users. The relationship between technology ownership, access, and online communications practices can perhaps be best understood using the Uses and Gratifications framework [23]. Under this framework, there are several assumptions that underpin an individual's use of media: communication behaviors are motivated, consumers are relatively active in their selection of media, social groups, such as friends and peers, motivate behavior, media compete with other channels for selection, attention, and overall use, and people are more influential in the media effects process than media themselves [23].

Using this framework and past research, it is likely that adolescents are especially engaged when selecting and using media. After all, users are generally interested in the utility of a particular technology, and are therefore both interested and motivated to use it [24]. Based on this research, if an adolescent perceived that a technology was useful in some way, such as for sending messages to friends, accessing the Internet, or monitoring ones' social networking profile page, he or she would be more likely to use that technology, and use it in specific ways. Previous research has found that perceived utility of a particular technology is a powerful predictor of use among adolescents [25]. This, of course, assumes that adolescents have access to such technologies. Research has shown that teens do have access to a number of new technologies, such as cell phones, video game consoles, computers/tablet computers [26], all of which give teens the opportunity to access the Internet. In fact, teens spend nearly as much time online as do adults, with 77% percent of adolescents spending over 1 hour online each day, much of that on social networking sites [5]. Using the example of social media use under this framework, one can imagine why adolescents would be motivated to select and use social networking sites. After all, it is something that their peer group engages in with great frequency [3], and given the importance of interpersonal relationships and friendships during this developmental period [27], adolescents likely see social networking use as critical to their social and emotional wellbeing. Therefore, with a sense of perceived utility and the motivation for use coming from close social groups and other friends, it makes sense that the number of Internet-capable technologies owned or accessible by an adolescent, the more likely they would be to access social networking sites. Therefore, we predict:

H3: there will be a positive relationship between the number of Internet-capable technologies accessible by an adolescent, the likelihood of having a social networking profile, and log-on frequency.

5. Predicting Communication Practices on Social Networking Sites

In the present study, however, we are not only interested in predicting overall use of social media; additionally, we are interested in predicting specific communication practices on social networking sites. We argue that when users choose to post on Facebook, update a status, or post on a friend's wall, they are actively selecting this medium due to its perceived convenience and utility in the communication experience; it allows them to communicate rapidly and easily with their friends, family, and others. Therefore, they have a communication intention in mind, are involved in the experience, and thereby are actively engaging in communication [28,29]. Here, we refer to these practices as constructive communication practices (e.g. updating one's status, posting on a friend's wall). In regards to constructive communication practices, the user has an intention in mind when engaging in this process; thus, they are generally involved and active as they work to construct a certain communication. In regards to non-constructive communication practices (e.g., watching a video on a friend's wall), while the user has actively selected the medium for its utility, they may not intend to communicate (explaining why they are clicking on other links), and are not as involved in the experience as they would be if they were the one posting the information [28,29]. Rather, although involved in communication, when users are engaging in these non-constructive communication practices, they are not actively involved the creation of the communication.

Both qualitative and quantitative research has indicated some possible predictors of adolescent online communication practices. First, Pempek, Yermolayeva,

and Calvert [30] found that, among a college-aged sample, users engaged in both content creation (which could include posting pictures or adding new information) and observing content (which could include reading information on others' walls or looking at others' photos). Although these researchers did not specifically ask where users were engaging in these practices (e.g., on a personal computer or in a public computer lab), it should be noted that this research indicates that social networking site users do engage in a blend of both constructive and non-constructive online communication practices. Using an adolescent sample, research by Lenhart et al. [3] found that teen ownership of technology, specifically cell phones, was related to using the technology for a broader number of purposes, such as sending more text messages or taking videos, which could include different communication practices.

Given the evidence cited previously, it is not surprising that owning Internet-capable devices would be related to increased use, due to the heightened accessibility afforded by not having to share the technology with someone else and the possibility of having the technology on one's person throughout the day. It also appears that adolescent owners of technology would be more likely to engage in constructive communication practices on social networking sites for a few reasons. First, given heightened accessibility, adolescent technology owners would likely have more time to communicate in general on social networking sites, and especially have more time to engage with others by carrying on online conversations through private messages, instant messages, and wall posts. With the growing number of adolescents that use the privacy features on social networking sites [18,19], it is also likely that adolescents may think about others' ability to see what they are posting on social networking sites. Being the sole owner of a particular technology may address this concern, as adolescents could control who might see their posted information in both on- and offline settings. For example, Livingstone [31] found that social networking sites give adolescents privacy from their parents, as adolescents work to connect with friends and therefore become more independent. Therefore, given that adolescents seek privacy from parents, adolescents with more access to private or personal technologies would be more likely to engage in constructive communication practices.

Although these practices were not referred to as constructive communication practices in these previous studies, each practice does require the user to actively select a medium based on a perception of utility. Also, the user must have some communication intention in mind, and thus, should be somewhat involved in the process. Therefore, these practices would all fit into the constructive communication framework as it is defined in the present study. In sum, adolescents should engage in more constructive communication practices, due to the privacy afforded by not having to share the device with someone who they might not want to share the information. It is unclear, however, if access to these technologies will be related to non-constructive communication. Therefore,

H4a: adolescents who primarily use a private home computer will use more constructive communication practices on their profile than adolescents who primarily use a shared home computer or adolescents who primarily use public computers.

H4b: adolescents who own a smartphone will use more constructive communication practices on their profile than adolescents who share a smartphone, own or share a regular phone, or those who don't own or share a cell phone.

H4c: adolescents who own Internet-capable mobile devices, such as iPod Touches, iPads, or other tablet computers, will use more constructive communication practices on their profile than adolescents who do not own any of these technologies.

RQ3: what is the pattern of relationships between private computer, smartphone, and tablet ownership and non-constructive communication practices?

6. Method

6.1. Participants

Overall, 909 children and adolescents between the ages of 8 and 17 completed an online survey instrument designed by the Museum of Science and Industry in Chicago, Illinois, USA during summer 2011. In the present study, we use data collected from 467 participants between the ages of 13 and 17 for analysis, as only this set of participants was asked about social networking site use. Although younger children do indeed use social networking sites, the largest, Facebook, is legally closed to individuals younger than age 13. In total, participants represented 48 states in the US, making the sample national in scope. There were no biases in terms of gender, age, race, or type of schooling. For a listing of demographic data collected from 13- to 17-year old participants, please see the 'demographics' section below.

6.2. Procedure

Once the survey instrument was created by the Museum of Science and Industry, Chicago, it was given to the market research firm MarketTools, which uses an ongoing consumer panel, for distribution. Parents of children ages 8 to 17 were contacted via email and asked to allow their child to complete the online survey. The link to the online survey was embedded in this email. Participants were selected based on their child's gender, race, age, and home address in the United States. Once parents gave their permission,

children and adolescents completed the survey, which took an average of 20 minutes.

6.3. Measures

6.3.1. Demographics

As part of the survey, participants were asked about their gender, age, race, and schooling. In the present sample, males made up a slight majority (54.8%). Almost 19% of the sample were 13 year-olds, 19.9% were 14 year-olds, 25.7% were 15 year-olds, 18.4% were 16 year-olds, and 17.3% were 17 year-olds. In regard to race, 80.0% were Caucasian, 7.6% were African-American, 5.9% were Hispanic/Latino, and 5.9% were Asian. Just over 83% attend public school, 10.5% attend to private school, 3.2% attend a charter school, and 3.2% were homeschooled. Median household income of participants was between $30,000 and $40,000.

6.3.2. Technology Access and Ownership

Participants were asked about their access to Internet-capable technologies and their ownership of such technologies. Specifically, participants were asked where they accessed the Internet: at home on their own computer (69.1%), at home on a computer they shared (41.8%), at school (45.8%), at the library (16.1%), or at a friend's house (28.1%). These percentages do not sum to 100% because these categories were not mutually exclusive.

Next, participants were asked if they had access to a smartphone (identified as a Blackberry, iPhone, or Android phone) or a regular phone (identified as any other type of phone that did not connect to the Internet). Nearly 60% had access to a regular phone, 25.9% had access to a smartphone, and 14.3% did not have access to either. The next question asked if they owned the phone from asked about in the previous question. Here, 80.7% reported that they did own the phone, whereas 13.2% reported that it was their mom or dad's phone, and 6.1% reported that it belonged to someone else in the family.

Finally, participants were asked if they owned any of the following Internet-capable mobile technologies: iPod Touch (27.5%), iPad (8.4%), Android Tablet (such as the Motorola Xoom) (3.5%), or a Windows Tablet (2.2%). Fifty-eight percent did not have access to any of these technologies. This was not a mutually exclusive variable, allowing respondents to indicate if they owned more than one of each of these Internet-capable mobile technologies.

In order to measure adolescents' overall access to Internet-capable technologies, their responses to the previously described three sections were summed. Therefore, this measure included the number of computers that they had access to (personal, shared, school, library, or friend's), whether or not they had access to a smartphone (one they owned or their parent's/relative's), and the number of Internet-capable mobile devices they owned (either iPod Touch, iPad, Android Tablet, or Windows Tablet). Overall, adolescents had access to an average of 2.93 (*SD* = 1.88) Internet-capable devices.

To measure technology ownership, we broke the types of technologies into three groups: computer, cell phone, and Internet-capable mobile devices. Computer ownership was then broken into two groups based on the computer that adolescents generally used to access the Internet: either from home on their own computer, or from home on a computer they shared. While it was possible to report using both a private and shared computer, those who reported having both were put into the private computer ownership group. Additionally, although some adolescents reported not having access to any computers at home, there were not enough in this group for statistical analysis. Overall, 72.3% of adolescents reported having their own computer, while 27.7% reported sharing a computer. Cell phone ownership was broken into 5 groups: adolescents who reported owning a smartphone (24.8%), adolescents who reported using their parent or relative's smartphone (0.9%), adolescents who reported owning a regular phone (50.9%), adolescents who reported using their parent or relative's regular phone (9.1%), and adolescents who did not own or have access to either smartphones or regular phones (14.4%). Finally, Internet-capable mobile device ownership was broken into two groups: those who reported owning at least one iPod Touch, iPad, Android Tablet, or Windows Tablet (64%), and those who did not own any of these devices (36%).

Adolescents' social media use was measured in two ways. To measure the total number of social networking profiles created, adolescents were given a list of 16 different social networking sites (e.g. Twitter, Facebook, Myspace, Stumbleupon, Bebo) and asked to check all of the sites they used at least once a month. The total number that each participant checked was summed in order to measure their total social networking profile ownership. Adolescents reported creating an average of 1.32 profiles (*SD* = 1.55). Secondly, adolescents were asked to respond, using a 1–7 Likert-type scale anchored by 'never' and 'more than five times a day', how often they checked a social networking site each day. Participants scored a mean of 5.52 (*SD* = 1.20). This indicates an average response between 'once a day' and 'two to five times a day'.

6.3.3. Social Media Communication Practices

Given the near ubiquity of Facebook use among the present sample, social media communication practices were measured by asking participants 13 items designed to assess how often they engaged in a number of activities on Facebook, such as posting photos, posting on a friend's wall, posting status updates,

watching a video, or clicking a link. These responses were measured using a 1–5 Likert-type scale anchored by 'never' and 'daily'. An exploratory principal-components factor analysis with varimax rotation yielded two dimensions with eigenvalues greater than 1. These two dimensions accounted for 62.86% of all variance and all items fell on their respective dimension with a factor loading greater than 0.60 and a factor loading on the other dimension lower than 0.40. One item ("How often do you play a game such as Farmville") did not load on either factor and was therefore dropped. Overall, 8 items loaded on the first factor (e.g. "How often do you post on a friends wall?", "How often do you post status updates about your life on Facebook?", and "How often do you comment on a friend's post?"). This factor was called constructive communication practices, because each of the practices involved the user actively posting or otherwise communicating some type of information on Facebook. The other factor, which we call non-constructive communication, consisted of 4 items (e.g. "How often do you click through a link in your News Feed or on a friend's wall?", "How often do you share a post from your News Feed?", and "How often do you share news articles, videos, or links from other sites with your fiends via Facebook?"). Both constructive (Cronbach's α = 0.88) and non-constructive communication practices (Cronbach's α = 0.85) were reliable.

7. Results

7.1. Ethnicity

Due to inadequate numbers of respondents in each ethnic group we could not analyze the data with ethnicity as a predictor of social networking use. Rather, we included it as a control variable in later analyses.

7.2. Gender

H1a predicted that females in the present sample would log onto Facebook more often than males after controlling for age and ethnicity. This hypothesis was tested by using an ANCOVA, which indicated a significant relationship (F (1, 364) = 5.96, $p < 0.05$). Specifically, females (M = 5.68, SD = 1.19) reported logging into Facebook more frequently than males (M = 5.37, SD = 1.19). Thus, H1a was supported.

H1b predicted that females in the present sample would be more likely to engage in constructive communication practices on social networking sites after controlling for age and ethnicity. An ANCOVA was used to test this hypothesis. Results indicated a significant finding (F (1, 360) = 9.92, $p < 0.01$). Specifically, females reported engaging in more constructive communication practices (M = 3.65, SD = 0.88) than males (M = 3.35, SD = 0.91). Therefore, these data support the predicted relationship in H1b.

RQ1 asked if there is a relationship between gender and non-constructive communication practices and was tested using an ANCOVA. Unlike H1b, results were not significant (F (1, 360) = 2.51, p = n.s.). Thus, there is no relationship between gender and non-constructive communication practices, providing an answer for RQ1. The results of this first set of hypotheses indicate that females log onto their profiles more frequently and engage in more constructive communication practices on their profile than males do. There is no relationship between gender and non-constructive communication.

7.3. Age

H2, which asked if adolescents aged 16 to 17 would log into their social networking profiles more than adolescents aged 13 to 15, was tested using an ANCOVA with gender and race as control variables. This test was not significant (F (1, 360) = 0.52, p = n.s.). Therefore, older adolescents (M = 5.59, SD = 1.05) are not more likely to log into social media sites during the day when compared to younger adolescents (M = 5.47, SD = 1.28), which provides an answer to H2. Another ANCOVA was used to test RQ2, which asked about the pattern of relationships between age and communication practices on social media sites. Results indicated that older adolescents (M = 3.52, SD = 0.84) did not use more constructive communication practices on social media sites when compared to younger adolescents (M = 3.47, SD = 0.95) (F (1, 356) = 0.14, p = n.s.). There also was no significant relationship between age groups and non-constructive communication practices after controlling for gender and ethnicity (F (1, 360) = 0.21, p = n.s.). Taken together, this provides an answer to the question posed in RQ2. Overall, there was no difference between younger and older adolescents in terms of the frequency with which they logged into social networking sites or their online communication practices.

7.4. Access

H3, which predicted a positive relationship between an adolescent's access to Internet-capable technologies, the number of online social media profiles they created, and the frequency of logging on to those profiles, was tested using two hierarchical multiple regressions. With the number of adolescent online profiles as the dependent variable, the control variables of gender, race, and age were entered on the first step and were significant (R = 0.14, R^2 = 0.02, F (3, 460) = 2.91, $p < 0.05$). Adolescent access to Internet-capable devices was entered on step two. This was significant as well (ΔR^2 = 0.23, $p < 0.01$; β = 0.49, $p < 0.01$). Therefore, adolescents with access to more Internet-capable technologies report having more online social networking profiles.

For the second hierarchical multiple regression, the frequency of logging on was entered as the depend-

ent variable. Again, gender, race, and age were entered as control variables, but were not significant (R = 0.13, R^2 = 0.02, F (3, 463) = 2.18, p = n.s.). The frequency of logging on to social networking sites was entered on step two and was significant (ΔR^2 = 0.02, $p < 0.01$; $\beta = 0.15$, $p < 0.01$). Therefore, adolescents with more access to Internet-capable devices have more social networking profiles and log into those profiles more often than those with less access to Internet-capable devices. These results provide support for H3.

7.5. Ownership

H4a predicted that adolescents who had their own private computer would use more constructive communication on their social networking profiles than adolescents who used a shared home computer or a public computer. An ANCOVA with gender, race, and age as control variables was used with constructive communication practices as the dependent variable. This was not significant (F (1, 354) = 0.36, p = n.s.). An ANCOVA with the same controls was also used to test non-constructive communication practices. This test was not significant as well (F (1, 354) = 0.98, p = n.s.). Therefore, computer ownership does not appear to influence the communication practices on social networking sites among adolescents, and thus, H4a was not supported.

An ANCOVA with gender, race, and age as controls was also used to test H4b, which predicted that adolescent smartphone owners would engage in more constructive communication practices on those profiles than adolescents who shared a smartphone with a parent, adolescents who either owned or shared regular phones, or adolescents who did not have access to any mobile phones. With constructive communication practices as the dependent variable, results were significant (F (4, 357) = 3.58, $p < 0.01$). Post-hoc tests with a Bonferroni adjustment indicated that smartphone owners (M = 3.76, SD = 0.80) differed significantly from regular cell phone sharers (M = 3.19, SD = 0.92) ($p < 0.05$), and adolescents with no access to cell phones (M = 3.20, SD = 1.00) ($p < 0.01$) (see Table 1). For non-constructive communication practices, results were similar (F (4, 357) = 3.22, $p < 0.05$). Specifically, adolescent smartphone owners engaged in significantly more non-constructive communication practices (M = 3.20, SD = 1.00) than adolescents who did not report owning a smartphone (M = 2.59, SD = 1.04), although these numbers were lower than those for constructive communication. In sum then, adolescents who own a smartphone engage in more constructive communication practices than regular cell phone sharers and adolescents who do not have access to a cell phone. These results offer partial support for H4b. Additionally, smartphone owners also engage in more non-constructive communication practices than those who do not own a phone.

Finally, H4c was tested using an ANCOVA with gender, race, and age as controls. This hypothesis predicted that adolescents who owned Internet-capable mobile devices, such as iPod Touches or iPads would engage in more constructive communication practices than adolescents that did not own such technologies. With constructive communication practices as the dependent variable, results were significant (F (1, 360) = 6.44, $p < 0.05$). Specifically, Internet-capable mobile device owners scored higher on the measure of constructive communication practices (M = 3.65, SD = 0.88) than adolescents who did not own any of these technologies (M = 3.39, SD = 0.91). These results provide support for H4c. For non-constructive communication behaviors, results were significant as well (F (1, 360) = 12.98, $p < 0.01$).

Table 1. Differences between Technology Ownership on Constructive Communication.

	M	*SD*
Computer Ownership		
Computer Owner	3.52[a]	0.92
Computer Sharer/No access	3.47[a]	0.86
Mobile Phone Ownership		
Smartphone Owner	3.76[a]	0.80
Smartphone Sharer	3.38[a,b]	0.35
Regular Phone Owner	3.50[a,b]	0.90
Regular Phone Sharer	3.19[b]	0.92
No Phone	3.17[b]	1.01
Mobile Device Ownership		
Mobile Device Owner	3.64[a]	0.88
Mobile Device Sharer/No access	3.40[b]	0.91

Note: superscripts [a] and [b] are used to indicate significant differences between the means within each technology ownership category. Means that do not share a common superscript in the same technology ownership category differ significantly at $p < 0.05$.

Similar to results for constructive communication, mobile technology owners engaged in significantly more non-constructive communication (M = 3.17, SD = 1.11) that those who did not report owning Internet-capable mobile devices (M = 2.74, SD = 1.04). Taken together, and similar to results for constructive communication, smartphone and mobile device, but not computer, ownership was related to increased non-constructive communication practices, providing an answer for RQ3.

8. Discussion

8.1. Summary of Findings

Overall, results indicate that adolescent demographics, access to technology, and technology ownership are predictive of both the frequency of social media log-ins as well as constructive communication practices. Specifically, data indicate that females tend to log into their social media profiles more often than males. Also, females were more likely to engage in constructive, but not non-constructive, communication practices when compared to males, making gender one predictor of social media use and certain types of communication practices. Age, however, was not a predictor, as it was not related to either log in behavior or communication practices.

In terms of access to technology, those with greater access reported having more social media profiles on multiple sites. Additionally, those with greater access also reported logging into those profiles more frequently than those with less access. Therefore, technology access, which in the present study included access to computers, cell phones (both smartphones and regular phones), and Internet-capable devices (such as iPads and tablet computers), is another predictor of both adolescent social media log-in behavior and online communication practices.

Finally, results indicated that adolescents with access to a personal computer were no more likely to engage in constructive or non-constructive communication practices than adolescents who only had access to a shared computer or no access at all. Smartphone owners, however, engaged in more constructive practices than adolescents who shared a regular phone or adolescents who did not have access to any type of mobile phone. Lastly, results indicated that adolescents who owned Internet-capable mobile devices engaged in more constructive and non-constructive communication practices than adolescents who did not own any of these devices. Overall then, results indicate that mobile device ownership, and not necessarily technology ownership of all kinds, was generally predictive of constructive and non-constructive communication practices among adolescents.

8.2. Implications

Practically, these findings are important, especially those that elucidate predictors of constructive communication practices on social networking sites. Overall, it appears that not all types of owned technology are related to increases in such communication practices online. Specifically, mobile technologies, such as smartphones and Internet-capable mobile devices like iPads and tablet computers, were related to increases in constructive communication practices, whereas having a personal computer was not related to any increase. This perhaps indicates the role that mobile technologies play in social networking use and online communication practices. After all, as predicted under the Uses and Gratifications framework, adolescent users of these technologies who perceive them to be high in utility will be more motivated to use them and presumably use them more often and for longer periods of time [20,21]. This is particularly important when considering the possible risks of social networking site use among adolescents. As noted by Barbosa et al. [14], large numbers of adolescents do post controversial and potentially self-identifying information on their profiles. Therefore, any research that illuminates predictors can be used to inform interventions and information campaigns that teach adolescents about the possible issues with posting such information (see [32]).

More so than computers, it makes sense that mobile technologies would be perceived by adolescents to be more useful, because they allow the adolescent to remain connected with friends online wherever they go. Since owning these technologies allows adolescents to update their profiles on the go, it follows that owning these technologies would be related to increased communication practices online. Here, the adolescent can quickly post a status update about the concert they are attending, the class they are sitting in, or the sporting event they are watching. Based on the results of the present study, it might not necessarily be the privacy of ownership that is related to these communication practices, specifically constructive communication, but rather, the addition of the convenience and features of certain technologies. That is not to say that privacy is not important; while mobile technologies allow for communicating on the go, they also allow the user to communicate in relative privacy if they so choose. The results of this study would seem to add to and extend to previous findings, indicating that perhaps both general ownership of technology as well as ownership of specific mobile technologies relates to constructive communication practices on social networking sites. Taken together with previous research, it seems that both the privacy and the convenience of mobile technologies may be related to both social media use and communication practices online. Therefore, the results of this study can be used to better understand the predictors of both social media use and online communication practices among adolescents. By focusing on demographic, technology access, and technology ownership predictors

of adolescents' social networking site use and communication practices, the present study adds to the current body of literature focusing on social and psychological predictors of use of and attitudes toward social networking sites (e.g., [33,34]).

8.3. Limitations and Future Research

Although efforts were made by the market research company to recruit participants from around the United States, the overall sample was not representative because it was only sent to parents of adolescents who had signed up on an online website. Despite this limitation to the sample, however, it must be noted that the sample was national in scope, and was not biased toward gender, age, or race. Additionally, as it was an online survey, the sample is biased against adolescents who do not have access to the Internet, although research indicates that this is generally a small percentage [3]. Finally, this survey was originally collected for the purposes and uses of the Museum of Science and Industry, Chicago, prior to the collaboration with the authors at Northwestern University. As a result, when analyzing the data for the purposes of this particular study the authors were limited by the specific questions asked in the original study.

Future research should continue to explore the relationship between ownership, access, and teen social media use. While the present study indicated some predictors of social media use, we did not measure *exactly* what adolescents were saying in either their constructive or non-constructive communications. Therefore, future research should examine other types of predictors, including social and psychological measures, that may play a role in youth's communication practices on social networking sites as well as explicitly what youth are saying in their communication online. Given the literature cited throughout this paper, it is likely that adolescents use such communications online to engage in a range of practices. As indicated by Valkenburg and Peter [9], it is possible that the adolescents in this sample used constructive communication practices to explore their identity while connecting to others. It is also possible that they used constructive communication practices to post possibly sensitive information about themselves. Therefore, using this study as a basis, future research can and should continue to examine the exact communication practices of adolescents on social networking sites, relating it to both positive and negative outcomes.

8.4. Conclusions

Overall then, results from this study indicate that demographics, such as gender, media accessibility, and certain types of media ownership are all related to increases in social media use among adolescents. Additionally, these predictor variables are also related to heightened communication practices online, which include posting pictures, commenting on friends' walls, and updating one's status. Given the mixed findings regarding adolescent communication practices on social networking sites, it is important to understand predictors of both social media site use and communication practices on those sites.

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Between Objectivity and Openness—The Mediality of Data for Journalism

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Abstract: A number of recent high profile news events have emphasised the importance of *data* as a journalistic resource. But with no definitive definition for what constitutes data in journalism, it is difficult to determine what the implications of collecting, analysing, and disseminating data are for journalism, particularly in terms of objectivity in journalism. Drawing selectively from theories of mediation and research in journalism studies we critically examine how data is incorporated into journalistic practice. In the first half of the paper, we argue that data's value for journalism is constructed through mediatic dimensions that unevenly evoke different socio-technical contexts including scientific research and computing. We develop three key dimensions related to data's mediality within journalism: the problem of scale, transparency work, and the provision of access to data as 'openness'. Having developed this first approach, we turn to a journalism studies perspective of journalism's longstanding "regime of objectivity", a regime that encompasses interacting news production practices, epistemological assumptions, and institutional arrangements, in order to consider how data is incorporated into journalism's own established procedures for producing objectivity. At first sight, working with data promises to challenge the regime, in part by taking a more conventionalist or interpretivist epistemological position with regard to the representation of truth. However, we argue that how journalists and other actors choose to work with data may in some ways deepen the regime's epistemological stance. We conclude by outlining a set of questions for future research into the relationship between data, objectivity and journalism.

Keywords: data; data journalism; mediality; regime of objectivity

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1. Introduction

The recent high profile success of projects like the Guardian's *Reading the Riots* and the growing legitimacy of independent investigative organizations such as Propublica highlight how *data*—its collection, analysis, and communication—are a major point of interest and concern in contemporary journalism. With no definitive definition for what constitutes data in journalism coupled with the existence of numerous labels for data-related journalistic practices (such as data journalism (DJ), data driven journalism, database journalism, computational journalism, data visualization) understanding data's place within journalism is problematic.

The starting point for this paper is that as the sophistication and accessibility of digital technologies for the collection, analysis and dissemination of data have become more widespread, so have the number of projects that turn to data for the production of news. Data's increasing importance within journalism raises a number of interesting questions and challenges, not least of which are the implications such data has for objectivity as one of the paradigmatic concerns of contemporary journalism. Data's meaning and value arguably stems from the extent to which it is said to be objective. But if objectivity's place within journalism is itself the source of much debate [1–3] then we must also question how data is imbued with the quality of objectivity within journalism. Instead of a history of practices like DJ or a sociological analysis of such practices, this paper draws from two different approaches—theories of mediation and journalism studies (especially political economy and media sociology approaches)—in order to question what constitutes data and how the different choices regarding its collection, interpretation and dissemination have implications for objectivity in contemporary journalism. The first part of the paper examines the connection between data and objectivity by focussing on digitally mediated data as an object used by journalists in ways that evoke socio-technical contexts in which objective data is produced—what we refer to as the mediality [4] of data. The second part of the paper delves into how the political economy of contemporary Western journalism shapes the production of objectivity [2] as a multifaceted regime. This second approach enables us to contemplate the implications that the different facets of this regime might have for data as a source of objectivity in contemporary journalism. In the final section, we put forward future research questions that build on these two approaches.

2. Data's Mediality

The term *data* is frequently applied in journalism literature as a mass noun. The Oxford English Dictionary provides two different definitions of the application of this term:

> a. Related items of (chiefly numerical) information considered collectively, typically obtained by scientific work and used for reference, analysis, or calculation.
>
> b. Computing. Quantities, characters, or symbols on which operations are performed by a computer, considered collectively. Also (in non-technical contexts): information in digital form. [5]

Both of these kinds of data have historically played a role in journalism. Journalists have long drawn on the outputs from scientific investigations as a resource for the production of news. Similarly, journalists have been developing techniques for using computers to analyse data since the late 1960s and early 1970s like precision journalism [6] and computer-assisted reporting [7]. A decade ago, scholars like Deuze ([8], pp. 8–9) pointed to the emergence of "open-source journalism" as a potential direction for new configurations of participation in journalistic practices. For Deuze, the Internet represented a new journalistic medium that afforded the opportunity to build communities of information gathering and dissemination similar to those of the open-source software community. Even more recently, Hamilton and Turner ([9], p. 2) defined computational journalism as 'the combination of algorithms, data, and knowledge from the social sciences to supplement the accountability function of journalism'. While similar in many respects to computational journalism, DJ's central preoccupation is how to produce news with data. As Bradshaw [10] puts it in the introduction to *The Data Journalism Handbook*:

> 'Data can be the source of data journalism, or it can be the tool with which the story is told—or it can be both. Like any source, it should be treated with skepticism; and like any tool, we should be conscious of how it can shape and restrict the stories that are created with it.' [10]

Implicit in Bradshaw's definition is that key aspects of journalistic practice and the values that underpin these practices—how to treat a source, telling stories—remain intact despite the fact that they involve the use of data. Our objective is not to determine to what extent DJ itself represents a genuine departure from its predecessors. Instead, we set out to problematize how practices and values involved in the collection, interpretation, and dissemination of data are mediated through current journalistic practice and values.

Sterne [4] uses the concept of mediality to examine how things 'evoke a quality of or pertaining to media and the complex ways in which communication technologies refer to one another in form or content' ([4], p. 9) and how these ways are articulated 'with particular practices, ways of doing things, institutions, and even in some cases belief systems'. ([4], p. 10). Building on this definition, we use mediality to ask how journalists treat data in ways that refer to forms or content of other socio-technical contexts. Conceptualising the mediality of data means problematizing

how data may at once evoke some of the symbolic and material qualities or practices taken from scientific enquiry or computation as presented in the above Oxford English Dictionary definition while also evoking the qualities and practices of news content produced and interpreted through journalistic forms with all of their political, cultural and technological baggage. Sterne's definition of mediality is useful because it highlights that we are not dealing with a *whole* medium like television, the Internet or newspapers. Data is in some ways both more specific and more abstract than such media. In order to clarify the implications of our chosen approach, we identify and develop three interconnected variable dimensions of data's mediality for journalism.

2.1. The Problem of Scale—Defining the Proportional Relations of Data in Journalism

For Rosen [11], journalism is a response to a 'problem of scale'. People, as part of a 'self-informing populace', are unable to consider distant current events and so turn to journalism as a way of understanding what is happening in the present-day world. Rosen extends his notion of scale beyond only physical distances to encompass all of the complexity of economic, political and social systems that come with the modern condition: what he terms the 'awayness' of things. The journalist's authority, he argues, stems from being able to claim a special perspective on the awayness of things and then relate this perspective to the public. As Rosen puts it:

> 'I'm there, you're not, let me tell you about it.' Or: 'I reviewed those documents, you couldn't—you were too busy trying to pay the mortgage—so let me tell you what they show.' ([11], p. 30)

Contemporary texts often represent digitally mediated data as part of a similar problem of scale: the coming 'data deluge' [12], 'working with data is like stepping into vast, unknown territory' [13], or 'huge tracts' [14] of data. Digital data's mediality as a large mass evokes the unknown quantity of ones and zeros that are so often used to symbolise the digital. This problem of scale can be used to justify an authoritative journalistic role in which the journalist can answer the public's questions about data. For example, Stolte presents digital journalists as key intermediaries who can tackle 'the sheer scale' of data by making large amounts of it accessible to the public in order to enable this public to 'receive the information without being overwhelmed by it' ([15], p. 357).

But the relationship between data's scale and the journalist's authority is one that needs to be carefully considered. As Webster ([16], pp. 21–25) and Mosco ([17], p. 50) remind us in their critical examinations of digital technologies, problems of scale can often be mobilised as ideological discourses to mask deeper political and social inequities.

For Couldry and McCarthy [18], differences of scale in the media can be understood as *proportional relations* that make up the different levels of media forms and content. To understand these relations requires that we remain attentive to the multiple ways in which they are brought together. A first step towards such an understanding in the case of data and journalism involves tending to the proportional relations between data and those involved in its production, dissemination and interpretation. For example, in their case study of a series of data-related projects in a Chicago newsroom, Parasie and Dagiral [19] recount a debate between two groups of journalists regarding how to work with data. The first group of journalists treated the quantities of data as a particular kind of computational problem; a problem that could be resolved by designing the right kind of platforms for accessing and analysing data. These platforms would be designed to provide the public with individualised access to *complete* datasets at a *granular* level, allowing individuals to analyse the data to see how it affected them personally. By contrast, a second group of journalists in the newsroom emphasized the importance of providing the public with inferential statistics based on the journalists' own analysis of a sample of the data; an approach closer to social-scientific traditions of data analysis. This debate between both groups of journalists illustrates two very different perspectives on data's problem of scale, and how to resolve this problem.

The repercussions of changes in scale are not predetermined: how different actors engage in the mediation of different levels of scale are not only potential sources of inequality but also represent opportunities for alternative forms of engagement, for resistance, and for change. Parasie and Dagiral's case study highlight two very different technological and organisational options for defining the proportional relations between journalists, data and the public with very different implications for all three. Our second dimension of mediality turns to the question of how different technological and organisational configurations work together.

2.2. Transparency Work–How the Collection, Analysis and Delivery of Digital Data Work Together as News

To count as news, data must be subjected to processes of refinement. As our second dimension, we use *transparency work* to examine the way in which these processes of refinement are materially and symbolically ordered as part of data's production and reception. In the context of journalism *transparency* refers to making publicly available the sources, interests and methods that might influence the information presented, so that notionally, readers/viewers (as *rational* subjects) can take potential *bias* into account in their own interpretation of the account. In this case, our definition draws from science and techno-

logy studies where it is used to describe a 'process in which status, cultural and community practices, resources, experience, and information infrastructure work together' ([20], p. 257). Work to make certain aspects of data transparent, like the transparency of media forms [21] or of information systems [20], relies on social and technological standards that may have very different meanings for different people.

A basic example for illustrating transparency work for data is information visualization. Much like scientific visualizations, journalists present datasets in the form of visual diagrams that highlight the insights they wish to communicate to the public. In some cases, visualizations take the form of interactive graphics that facilitate data analysis for the general public. Interactive graphics prescribe a certain way of interacting with the datasets, making it easier for someone who is unfamiliar with data analysis to gain insights from the data. But someone who is able to conduct their own independent analysis of the datasets may interpret these same visualisations as too constraining or prescriptive.

A more complex example of transparency work with data is the provision of *raw data* as an accompaniment to a news story. For example, the Guardian's *Data Blog* [22] gives readers access to datasets online and invites readers to 'download the data' in order to conduct their own analysis. The process of making this data available to the public builds on open source principles discussed below. But this data's 'rawness' is a relative state that depends on its own refinement processes. The way in which journalists collect and format their raw data in order to present it to the public depends on a number of implicit and explicit standards, practices, and values in the same way as with information visualisation graphics. For example, the journalist may decide to clean up or format the raw data before making it available to the public. The difference between data visualizations and raw data is that providing raw data can be interpreted as an invitation to reinterpret or challenge the results of the analysis of a dataset. But while the standards for using data analysis to challenge results may be familiar to those trained in such techniques, it is unlikely to be a set of skills and knowledge that is widely available to the general public.

Transparency work does not only take place between journalists and the public. Producing news items with data also entails refinement processes among journalists. Cohen, Hamilton, and Turner, for example, deem the efforts that go into converting data from paper documents or other primary sources to be the "bothersome impediments of more interesting work" ([23], p. 71) that is possible once such primary sources have been digitised and converted into a format that can easily be analysed. Cohen, Hamilton, and Turner recommend developing more accessible methods and tools for journalists who are unfamiliar with data analysis in order to facilitate their work. These platforms would make certain aspects of data analysis transparent to novice journalists.

We recognize that a certain amount of transparency work is, to a greater or lesser extent, always involved in data collection, analysis and dissemination. But considering transparency work with regards to data raises questions for the politics of producing different kinds of transparency, particularly in light of the problem of scale discussed above. What values and objectives inform the decisions regarding transparency work? In the following section, we examine how 'openness', as a set of values based on the provision of access to data, represent a third dimension of data's mediality in journalism.

2.3. Openness: Extending Access to Data

It is said that files saved in the Portable Document Format (PDF) are where 'data goes to die' [24]. Such a claim is arguably exaggerated, but data journalists and programmers base it on the fact that data stored in PDF files are not as easy to access as data stored using other file formats. There currently exists a movement within a number of different institutions that emphasises making data more *open* in part by ensuring that data is not stored in these kinds of formats. A detailed discussion of the term *open data* is beyond the scope of this paper. The history of open data has close ties to the history of computing including software development. Open data's history also builds on the long-established and well-documented academic tradition of peer-review in academic research (for example, see [25] for further discussion). Movements espousing open data often subscribe to a *do it yourself* (DIY) ethos. In the context of journalism, this implies that if a reader is unconvinced or suspicious of the conclusions drawn from the data for a news story, they are given free rein to analyze the raw data themselves and draw their own conclusions. What constitutes open data for journalists is still the subject of debate but here is an example of a definition:

> 'structured primary information from an organization —meaning unfiltered and complete information— provided in an accessible, machine-processible, non-proprietary, license-free format' ([26], pp. 17–18).

Such definitions and the different ways in which they can be implemented as part of journalistic practice have serious implications for how people access data. For the purposes of this paper, we define *openness* as 'efforts to extend access to "data"' ([27], p. 1). This definition of openness draws inspiration from Gurstein's critical examination of open data. For Gurstein, proponents of open data tend to focus on access over other issues, resulting in an understanding of data that is isolated from other social and technological processes. While Gurstein does present a solution to this problem (discussed in Section 3.3) the provision of access to data remains a key concern

among open data enthusiasts. We use openness to examine the different ways in which this provision of access to data, as a set of values and objectives circulating in (among other contexts) academic research and computer engineering, is articulated in the context of journalism.

As an example, open data initiatives to pressure governments to provide the public with greater access to government data have meant that open data enthusiasts and journalists have historically shared an interest in openness [28]. The recent push by some news media organisations to lay bare their raw data suggests unprecedented moves to editorial openness ([3], p. 196) that extend the open data movement to journalism itself. In such cases, disclosure about the sources of data is assumed to improve accessibility, and to enable the public to make better judgments as to the trustworthiness and truth-value of news. Emphasising openness represents a qualitative shift from practices and processes whose apparent objectivity and credibility derives from *authoritative* sources, to practices and processes that ensure the openness of data. But, as we will see in the following section, what constitutes openness for journalism is still contested and may lead to diverging approaches [28]. We stress the distinction between transparent *raw data* and *open data* to highlight these different trajectories in its production and circulation.

2.4. Does Data Make Journalism More Objective?

To date, we have consciously discussed data's mediality in journalism without concern for whether or not these different dimensions have implications for data's status as a source of objectivity. The meaning of data may be familiar in the socio-technical contexts of scientific enquiry and computation but data's production, circulation and interpretation within the context of journalism cannot simply be understood as a straightforward and unproblematic transplant from these or any other contexts. The problem of scale, how transparency work takes place, and how to ensure openness are all examples of variable dimensions of data's mediality: the contingent ways in which data can be used in the context of journalism while evoking qualities and/or practices taken from empirical research or computation. While such dimensions may to a greater or lesser extent implicitly rely on data's status as objective, they do not in themselves ensure objectivity. The implications of data's mediality for its status as a source of objectivity are made all the more complicated if we consider how journalism has its own longstanding methods and technologies for producing objectivity. In the second part of this paper, we therefore turn to a multifaceted journalism studies model of the production of objectivity within journalism in order to reflect on how such a structure may in turn shape data's place in journalism.

3. Data, Journalism, and the Objectivity Regime

Objectivity in journalism, like data, is not a single, *fixed thing* but can include a range of meanings amongst different journalists in western liberal-democracies: in some cases it might refer to how journalists negate their subjectivity, in others it refers to ensuring the fair representation of opposing sides in a controversy and maintaining a sceptical approach towards all sides in a dispute, in yet others it refers to the provision of facts in order to contextualize an issue [1]. The historical sources of objectivity, and the periodization of its emergence are much debated [3]. The history of objectivity as a key concern in Anglo-American journalism can partly be attributed to the incorporation of technologies like the telegraph and photography into journalistic organisational forms like wire services in the 19th century. Mass-market advertising is also said to have greatly contributed to a declining support for a partisan press in the same period.

In this section, we explicate the *regime of objectivity* as a dominant, yet contested [29], North American [30] journalistic paradigm. As outlined by Hackett and Zhao ([2], pp. 82–88), in their conception, US journalism has been characterized by the hegemony of a discursive 'regime of objectivity' for much of the 20th century:

> 'The idea-complex—and set of practices—of journalistic objectivity…provide *a general model for conceiving, defining, arranging, and evaluating news texts, news practices, and news institutions.*' ([2], p. 86)

In Hackett and Zhao's view, it is a polysemic, contested and flexible idea-complex or discursive/institutional regime, with five interacting levels or elements: (1) a normative ideal (concerning both cognitive and evaluative dimensions of news); (2) an epistemology; (3) newsgathering and presentation practices, both reportorial and editorial; (4) a set of institutional relationships, such as to create the impression of journalism's autonomy from illegitimate outside pressures or internal imperatives (e.g. the separation of 'church and state' between editorial and advertising/marketing departments); and (5) an active ingredient in public discourse. The objectivity regime reinforces the journalist's claim to authority as a legitimate intermediary between the public and world events by presenting the journalist's account as *universal* and *neutral*. But objectivity as constructed through the objectivity regime also sustains what some would call a hegemonic ideology [3] that consolidates power for a few dominant actors, and for conventional social values.

Journalism is currently in profound transition, with multiple paradigms competing with the regime of objectivity, which is arguably on the wane [31]. However, digitally mediated data represents at once an opportunity for positive changes to journalism's objectivity regime and a risk that new inequities will take shape or established ones will be reinforced. It is

therefore essential that we consider how the different facets of the objectivity regime produce objectivity in order to begin to consider how such structures may enable or constrain the meaning of data.

3.1. Data and the Objectivity Regime's Normative Ideal

The normative ideals of the objectivity regime prescribe certain traits to objectivity in journalistic practice: detachment, impartiality, avoiding personal biases and interests, etc. [32]. We find that these and similar traits still apply to DJ including originality, independence, statements grounded in facts that are verified by journalists ([33], p. 187), the criteria of utility, reliability, trustworthiness ([33], p. 189) and scepticism [10]. Data provides a factual basis for analysis, attempts to minimize the risks of incorrect reporting [9], and represents the potential to counter the influence of public relations. The same 'fundamentals' of journalism are in play in DJ literature as they have been for journalists in the objectivity regime: editorial decision making, fact-checking, ethics, storytelling.

In some respects, data journalists' push for greater openness de-emphasizes certain aspects of what used to be an important form of social or cultural capital for journalists—their relationships with individual sources, their Rolodex (a pre-internet metaphor) as a semi-secret treasure chest of authorities or whistle-blowers they could employ to enhance their professional capital, and credibility. But data also depends on a greater emphasis on certain well-established ideals of the objectivity regime such as accountability. Traditional news media achieved this ideal through practices such as editorial corrections of factual errors, the interventions of ombudsmen and publication of readers' responses to stories. One of the ways in which data can be used to ensure greater accountability is through greater openness afforded by giving the public access to raw data. This type of openness draws on normative ideals from sources outside journalism and adds new ethical touchstones by enhancing the perceived validity of journalists' truth claims. The danger in such a development, however, is that it may further absolve journalists from taking responsibility for what McChesney calls the 'inescapable part of the journalism process' ([34], p. 302), namely deciding what counts as news. In cases where the public is only given access to raw data and the means to analyse it without the journalist's explicit claim of what is significant about this data, the journalist is effectively offloading the responsibility of understanding the data's significance onto the public.

3.2. Data and the Objectivity Regime's Epistemology

Part of the objectivity regime thesis posits that contemporary journalism, particularly as practiced in Anglo-American liberal democracies, depends on a compromise between a positivist faith in facts, and an emphasis on balancing various points of view that implies an epistemological position of conventionalism, one that asserts the incommensurability of conflicting discourses [35]. At first glance, data journalists may seem to challenge positivism by taking a more conventionalist epistemological position with regard to the representation of truth. The truth-value of a story no longer depends exclusively on the stance of an individual reporter as an independent, neutral, detached, skilled observer. The collection and analysis of data in some DJ projects constitutes a collective enterprise where data collection is crowd-sourced and the analysis is participatory (for example, the Guardian's *Reading the Riots*). In such projects, news becomes iterative and dialogic: the data co-exists with the story, alongside it, and new insights gleaned from its analysis have the potential to modify the story.

Participatory forms of DJ are similar to other forms of online journalism in that they suggest a kind of postmodernist approach where journalists and the public create reality through language and interactions thereby transforming notions of truth seeking in journalism: participation and involvement trump distance and detachment ([3], p. 195). However, the ways in which data journalists implement openness may in some ways deepen the regime's positivist epistemological stance. As noted above, the provision of raw data is used to increase the perceived validity of truth claims by basing them on methods imported from scientific research and computing. That importation is an important aspect of data's mediality within journalism, and heightens the impression that the story being told is in principle empirically falsifiable (i.e., testable against empirical evidence). Just as part of the objectivity regime's epistemology was indicative of modernist journalism, data journalists' commitment to facticity means that they reproduce the incumbent *news net* [36]: reality can be described through careful, systematic analysis of data.

For Simon Rogers, the Guardian's former editor for the Data Blog and a major figure in DJ circles, the implications of this implementation of openness for epistemology remain consistent with established journalistic tradition as long as such implementation entails giving the public as much detail about the provenance of the data used to produce a news story:

> 'Data can be as subjective as anything else, because the choice of some types of data over others, or choice of stories, is based on my prejudices. But we have to try to be objective. There is a purity of reporting to it that is quite traditional. We put caveats in our stories about the data: Who gathered it? What do we know about how it was collected?' [37]

Others see in DJ an opportunity to improve data collection by official institutions through a combination of fact checking data and *watchdog journalism* [9]. Greater computational resources for journalists have decreased the cost associated with doing this type of

'watchdog' coverage and increased the level of public interest for political issues 'by personalizing the impact of public policies' ([9], p. 12). As digital data becomes more prevalent, journalists should extend their watchdog role to this data, recognizing that faith in official sources of data must be tempered by healthy scepticism and that with raw data must also come better indicators of its quality and provenance.

But journalism itself is not as good at extending this watchdog role to its own work with data. Implementing checks on the collection and analysis of data as part of exercising a healthy scepticism towards data relies on the very kind of social scientific epistemological traditions and expertise that are currently being challenged by programmer-journalists. It seems unlikely that reliable indicators of quality and provenance will consistently be put in place when we consider the rather limited extent to which journalists and journalist watchdogs re-examine and correct the use of incomplete or inaccurate data. For example, Messner and Garrison's [38] review of literature on journalism identifies a considerable amount of warnings to journalists about the prevalence of *dirty data* in datasets and advice on how these same journalists should deal with dirty data when writing a news item. But when the two search for instances of fact checking and/or corrections of dirty data in actual reporting, they conclude that:

> 'The authors are quite alarmed at the lack of attention given to [fact checking and/or corrections of dirty data] in the literature of journalism and mass communication, particularly in the literature of newsgathering. From earlier research about computer-assisted reporting, various conferences and presentations in the past decade and a half, and in discussions with professionals, it was an issue that simply remained below the research radar.' ([38], p. 97)

Finally, data journalists also run the risk of limiting their caveats to source material and to the values of the author without also including caveats as to the methodological biases and epistemological assumptions embedded in the methods used to gather the data (where *gathering* implies that the facts are lying around waiting to be collected). A simple example of such methodological bias can be suggested by the official categorization of *the unemployed* in governmental estimates of the unemployment rate. Such official statistics exclude those who involuntarily work part-time or who have given up looking for work and therefore are no longer categorized as part of the unemployed portion of the labour force.

It seems unlikely that the objectivity regime's unbalanced stalemate between positivist and conventionalist epistemologies will disappear. One of the questions raised by the use of data in journalism is how such a compromise may be reconfigured—for better or worse—by the different ways in which data is collected, analysed and presented.

3.3. Data and the Objectivity Regime's Practices

Rogers writes that DJ is at its core about 'telling the story in the best way possible' [39] rather than about flashy graphics or sophisticated interfaces. Rogers [39] goes out of his way in his definition of DJ to establish that it is an extension of traditional forms of journalism:

> 'If data journalism is about anything, it's the flexibility to search for new ways of storytelling. And more and more reporters are realising that. Suddenly, we have company—and competition. So being a data journalist is no longer unusual. It's just journalism.' [39]

Rogers stresses a distinction between thinking about data as a journalist and thinking about data as an analyst. This distinction seems to revolve around the continued primacy of the narrative form in the production of news and of the journalist's role as author of these news stories. Such a view is consistent with the objectivity regime in that the journalist is the one imbued with the knowledge and skills required to separate *fact* from *opinion* through the practice of news reporting. Contemporary journalists have developed design and storytelling strategies for producing interactive news items based on data visualization that ensure the kind of *narrative control* supposedly ceded to the reader because of digital media. According to Segel & Heer's [40], analysis of a sample of different kinds of narrative visualizations that include DJ news items:

> 'Generalizing across our examples, data stories appear to be most effective when they have constrained interaction at various checkpoints within a narrative, allowing the user to explore the data without veering too far from the intended narrative.' ([40] p. 1347)

Both Roger's definition of DJ practice and Segel and Heer's insights into storytelling techniques with data raise the question of how different techniques for the provision of openness in DJ can co-exist with transparency work for data: how to extend *access* to data while also making the insights gained from data analysis *accessible*? Gurstein suggests that while considerable good has come from (and may continue to come from) open data movements, how its proponents choose to pursue its implementation may have unintended consequences that lead to greater inequality. His critical examination of the open data movement leads him to conclude that disparities are appearing between those with access to the right kinds of technology and the knowledge to use such technology and those who do not have such technologies and/or knowledge. So while data may be open, how different actors can engage with open data varies considerably:

> 'Thus, rather than the entire range of potential users being able to translate their access into meaningful applications and uses, the lack of these

> foundational requirements means that the exciting new outcomes available from open data are available only to those who are already reasonably well provided for technologically and with other resources.' ([27], p. 2)

For Gurstein, the processes of interpreting data and subsequently being able to make 'effective use' of this same data are just as important as ensuring access to data. He concludes that any critical analysis of *open data* has to involve questioning how and under what conditions data is contextualized and given meaning ([27], p. 4). In other words, storytelling with data or providing access to raw data cannot be understood in isolation from how those stories or that access are interpreted and in what way those who interpret the data are able to incorporate it into their lives.

One way to connect access to data with its interpretation and use is to align journalistic practice with open data movements that support a DIY approach to data. This realignment could be consistent with the current shift away from journalists having complete authority over the storytelling process and towards what Rosen [41] calls 'the people formerly known as the audience' via crowd-sourcing of data analysis and discussion forums [24]. In such cases, the journalist's role shifts to performing more administrative tasks surrounding the provision of access to data such as *curating* data, managing discussion lists, determining which of multiple blog contributions go to the top, and shaping stories into articles that span more than one publication/edition. At its best, curating data can prove to be a positive solution to the problem of scale by directing audiences to the best datasets and educating them in their use ([33], p. 190). At its least, curating data can simply be a euphemism for the management of data without analysis as discussed above.

Another way to connect openness with the interpretation and use of data may be by providing *context* for a news story. Journalists can use data to introduce more background to stories by taking the focus away from timely events towards providing greater information related to the reported event, but which lies before, after or outside the event itself. Under the strictures of objectivity in US journalism, reporters tend to shy away from providing background context partly from fear of accusations of bias: sticking to the *facts* that journalists observe themselves or that can be confirmed by *authoritative* sources, can be seen as examples of *strategic rituals* [42]. Journalists can use data in this way to move beyond the objectivity regime's event- and official-orientation. But to the extent that data journalists fail to question the assumptions embedded in datasets, or to recognize that *any* selection of a relevant context is inherently political, they may unwittingly reinforce the *frame-blindness* ([3], pp. 66–70) of the objectivity regime.

Concerns for connecting the provision of access to data with its interpretation and its effective use are not limited to the relationship between the journalist and the public. Journalists face the same challenge in their own work. We must question to what extent journalists are able to draw attention to the flaws and particularities of the data they use to tell news stories and to what extent they recognize and respect the limits of data's portability beyond one specific news story. Many of the recent high profile examples of DJ, such as the projects listed on the Guardian's Data Blog, are the result of journalists taking a customized approach to the collection of data and its analysis based on the specific story being covered [43]. It is unclear whether such efforts can be maintained as data becomes more closely integrated into the everyday practices of news production. As the production and circulation of data become increasingly automated, relying less on offline sources, and as sources of open and/or raw data become more readily available, the participatory and bespoke (customized) approach to data gathering for individual projects may be undermined.

The stakes of the extent to which journalists are equipped and given the time to interpret and effectively use data become all the more evident when we take into account that not all types of journalism deal with the same kind of data in the same way. For example, some researchers have set out to develop a 'reporter's black box' ([44], p. 4) that would provide journalists with a set of standard query templates for working with data—a standard set of questions that journalists could use to analyze a dataset. Such standard queries are deemed particularly useful in journalistic practices that produce consistent kinds of queries from familiar datasets such as in the case of sports journalism. But standardized queries may be more problematic in the case of investigative journalism. The technical knowhow and expert knowledge needed to conduct research are perceived to be a major concern among journalists ([23] p. 70) and in such cases, the provision of user-friendly platforms for the production of news represents an interesting business proposition.

The pace and direction of technological change also suggests that the connection between narrative and objectivity embodied in journalists' practice may undergo even more dramatic changes in the near future. Current innovations in the automation of computational processes such as online searches lead some observers to consider replacing the journalist with computational resources:

> […] 'eventually some watchdog articles will be written by algorithm in a way that would allow readers to see a customized, personalized article about how a policy problem is playing out in their neighbourhood, block or lives.' [45]

3.4. Data and the Objectivity Regime's Institutional Relationships

The objectivity regime is embedded within a set of interdependent institutions that tend towards its reproduction. These institutions include legal guarantees

provided by the state, institutions of higher learning that contribute to journalism as field of knowledge and structural arrangements within news organisations such as the separation of marketing functions from editorial functions. Much of the current literature on DJ is written from an internalist perspective ([46], pp. 2–5) in that it is frequently presented by proponents from within journalism as a way to potentially *save* it from its current state of declining credibility and economic disinvestment. It would therefore seem that data is unlikely to be used to disrupt existing institutional relationships so much as to improve and strengthen them by, for example, identifying viable business models. It is therefore of vital importance that we question to what extent the variable dimensions of scale, transparency and openness for data develop within the institution of journalism but also within related institutions like commercial enterprises and governments.

Data journalists' ties to the open data movement can in some ways serve the commercial interests of media corporations, but in a new context. Historically, the material interests behind the objectivity regime included the interests of advertisers and commercial media in generating and capturing the attention of new broad audiences in the era of the emergence of mass marketing. Other factors included the political interests of media corporations in deflecting political demands for government regulation of newspaper monopolies that were emerging by mid-20th century and in managing the media/state relationship more broadly. Also served were the occupational interests of journalists in enhancing their claims to *professional* status via the specialized skill of objective reporting ([2], pp. 60–81). Similarly, in the 21st century, collecting and interpreting data helps journalists adapt to global capitalism's information flows and to harness the potential to monetize both databanks and data analysis apps ([33], p. 191). Lorenz [47] points to examples such as the *New York Times*' custom search platform for finding and purchasing a home. DJ can help news organizations to brand themselves and to restore audience and popular trust in journalists through the provision of open data as a service and to enhance journalists' professional status in the new role of its curatorship.

Journalism in Western democracies is legally and politically protected in ways that are not available to other types of organisations or disciplines (for example, see [48] on a comparison between journalism and epidemiology and their common remit to access and publish findings from private data). Such protection extends to data journalists because, in line with the objectivity regime, journalism presents itself in terms of altruistic values such as the democratization of information. This legal protection may enable journalists to assist open data movements. Open data movements have encountered considerable resistance from local and national public institutions (see [19] for an example of local resistance to open data in the Chicago Police Department). In a recent case study of the Obama administration's plans for a national US Open Data Program, Peled [49] shows how various departments of the US government responded to requests to implement an open data policy by various resistance tactics. Peled concludes that individual departments perceive each other to be in inter-bureaucratic competition and use data as a source of leverage between departments. An open data policy undermines such inter-departmental horse-trading. The Obama administration's early attempts to implement an open data government program failed from a civic perspective because the data made available online was considerably limited in scope and not regularly updated.

By striving for greater openness, data journalists may impose greater scrutiny of government and how it produces and provides data (the watchdog role mentioned above). But some see conflicting professional objectives between journalists and proponents of open government data. Cohen [28], for example, identifies a potential rift between people who want to produce *studies* and people who want to write *stories*. She recognizes that no matter how much people working to improve the provision of open data in government believe they are only working to increase levels of collaboration with civil society, the collection and provision of data can always be used to serve certain political or ideological interests. In such cases, it is in the journalist's interest to scrutinise and challenge such data, no matter how *open*. In such cases, proponents of open government data and journalists may find themselves in opposing camps.

Data collected independently by journalistic institutions represents another way in which data may challenge established institutional power, especially the dominance of official sources. Any particular spin on political events, for example the recent MPs' expenses scandal in Britain, can potentially be challenged by an alternative story emerging from data analysis. Collecting data may also raise the possibility for new kinds of partnerships between news organisations and other kinds of informational or media organisations as a means of providing goods and services through databases and digital platforms ([33], p. 191). What remains lacking at the moment is a critical discussion of the ethical implications of journalistic institutions collecting and storing data and what such potential collaborations may have for journalistic independence and public service.

The emphasis on open data for DJ practitioners does not necessarily mean that incumbent institutions will lose such a status. Nor does it mean that journalistic institutions are impervious to challenges from new actors. Broader civil society movements for *open government* in some respects can be interpreted as the other side of the DJ coin. But the issues raised by open data movements also come bundled within broader debates concerning intellectual property rights

regimes and the commercial interests for open data that include powerful actors like Google and some Internet service providers.

The recent case of the 2010 Wikileaks episode and the differential treatment accorded to its participants suggest the uneven power relations involved in forwarding the agenda of journalistic openness. Wikileaks' original 'pure leak strategy' ([50], p. 154) of providing all of the raw data from their Afghanistan war logs online in an attempt to provide maximum openness was met with little public fanfare. It was only once Wikileaks collaborated with *The New York Times*, *The Guardian* and *Der Spiegel* to provide a more refined analysis that the data started to gain public attention. Subsequently, Bradley Manning (now known as Chelsea Manning) was sentenced to 35 years in prison in August 2013 for leaking classified documents to Wikileaks. By contrast *The New York Times*, *The Guardian* and *Der Spiegel,* having helped to publicize the leaked material, are not facing legal retribution [51] and arguments are ongoing as to whether or not similar relative legal impunity should be afforded to Wikileaks which functioned as a middleman between Bradley and the news media.

3.5. Data and the Objectivity Regime as an Active Ingredient in the Public Discourse

This final dimension to the objectivity regime recognizes that the expectations of objectivity and the associated language for evaluating news are actively circulated among members of the public, where they shape and are shaped by the everyday lives of those who engage with news reports.

Earlier sections addressed the importance of ensuring that data's openness is not understood in isolation from the ways in which said data is interpreted and used by the public. It is therefore of vital importance that we question to what extent data is part of public discourse regarding journalism and its objectivity. For example, to what extent is the DIY ethos of open data something that is reflected in the way people engage with news reports in their everyday lives? For Natalie Fenton ([52], pp. 559–560) multiplicity and polycentrality represent characteristics of online journalism that enable journalists to offer a view of the world that is 'more contextualized, textured, and multidimensional'; a view that may challenge traditional objectivity by enabling readers to compare reports and access sources. On the other hand, she warns that behind such multiplicity can be more of the same: sophisticated marketing and commodification. Political discourse can be assimilated into entertainment, public discourse can be further homogenized, the concentration of ownership increased including the control of search engines. These risks of marketing and commodification are undoubtedly relevant to data's future place in journalism and in the wider public discourse about journalism.

The question therefore remains to what extent, and in what ways, does the public actually access, interpret and use journalistic data? In our review of the current literature, we did not encounter any material that addresses the variety of ways in which the public actually engages with data beyond the occasional DJ projects that rely on crowd sourcing data.

4. Data and Journalism: Questions for Future Research

This paper represents a critical interrogation of data, its place in journalism, and a call for scholars to fruitfully bring together insights from mediation theory and critical political economy and sociology of journalism to the study of data for journalism. We do not raise these issues in order to reject or undermine practices like DJ. Rather, we recognize data's complex and contradictory potential within (and beyond) the journalism field—a potential that in certain respects *does* have significant democratizing implications. Our objective in introducing the three variable dimensions of data's mediality and how data relates to journalism's regime of objectivity is to underline how data's future is contingent upon decisions regarding what constitutes data and the consequences of such decisions for how objectivity is produced through journalism as a set of ideals, epistemologies, practices, institutional relationships, and public discourses.

Such a future could entail placing DJ in relation to historical precedents and contemporary developments within journalism such as peace journalism [53]. DJ could improve approaches to peace journalism by strengthening the empirical basis of the cultural and structural violence that (Peace Studies scholars argue) underlies the physical violence of armed conflict; it enables researchers to more adequately explore the causes and consequences of violent conflict. For example, one could explore statistical linkages between unemployment, rising food prices, or evidence of government corruption, with outbreaks of civil unrest, like the so-called Arab Spring. Or explore the hidden costs of war (another injunction that peace journalism theory suggests for conflict reporting) by, for example, correlating spikes in domestic violence and divorce rates with the return of soldiers from war.

Based on the approach we have devised for this paper, we also suggest two sets of questions for future empirical research:

1. To what extent are roles for the collection and presentation of data within journalistic institutions consistent with those previously developed within the objectivity regime? In what ways do the definition and execution of such roles remediate practices and discourses found in scientific research?

2. How is data part of public discourse regarding the objectivity of news? In particular: (a) how does public discourse on data in journalism mediate cultures of computing; (b) how does public discourse on data in

journalism mediate cultures of scientific enquiry?

Data's objectivity, when collected, interpreted and disseminated by journalists, cannot be taken as a given. Data is technologically, organizationally and symbolically mediated through discourses and practices for its collection, representation and dissemination that evoke empirical research or computational processes as well as aspects of journalism. The inherent facticity of data is itself problematic. This paper was not written in order to resolve such a problem but as a call for tempering the claims made for data in the context of journalism, for interrogating the assumptions that come with data as an object circulating between multiple contexts, and for a more systematic enquiry into the unstated interests that such data, as a source of objectivity, serve.

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29. As we will show below, the regime's dominance has arguably been unraveling due to different pressures in recent years but it is unclear what kind of formation is taking its place.

30. While the paradigm is found for the most part in the United States and in Canada, we can also point to parts of Western Europe and historically colonial states such as Australia where permutations of this regime are also found.

31. "The current status of objectivity in journalism is complicated. In the US, objectivity was a characteristic of journalism's mid-20th century "high modernist" period, one that has arguably been eclipsed since the 1980s by a "postmodern" paradigm characterized by a multichannel mediascape, profit-oriented conglomerate ownership, deregulation, the commodification of the public sphere, the displacement of "serious" news by infotainment, the unfolding impacts of the internet, and an epistemological relativism that rejects the possibility of objectivity." Hackett RA. Objectivity in Reporting. In: Donsbach W, editor. Concise Encyclopaedia of Communication. Malden, MA, USA: Blackwell; forthcoming.

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Research Article

The Nanking Atrocity: Still and Moving Images 1937–1944

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Abstract: This manuscript investigates the facts of publication of the images of the Nanking Atrocity (December 1937–January 1938) in *LIFE* and *LOOK* magazines, two widely read United States publications, as well as the Nanking atrocity film clips that circulated to millions more in American and Canadian newsreels some years later. The publishers of these images were continuing the art of manipulation of public opinion through multimodal visual media, aiming them especially at the less educated mass public. The text attempts to describe these brutal images in their historical context. Viewing and understanding the underlying racial context and emotive impact of these images may be useful adjuncts to future students of World War II. If it is difficult to assert how much these severe images changed public opinion, one can appreciate how the emerging visual culture was transforming the way that modern societies communicate with and direct their citizens' thoughts.

Keywords: Nanking Atrocity; impact of still and moving images

1. Introduction

In 2008, the seventieth anniversary of the Nanking Atrocity passed with limited international interest in the event that marked Japan's depredations in the Chinese capital city of Nanking (Nanjing) from December 1937 through January 1938. The event, including the wholesale murder of captured soldiers and civilians, and the rape of thousands of women, later became iconic as the "Rape of Nanking". This study will investigate the facts of publication of the images from Nanking in the weeks and months following the event, in *LIFE* and *LOOK* magazines, two new United States photograph journals competing with each other and with the newsreels. They claimed a readership of seventeen million and one million respectively. The photograph journals' images were Japanese soldiers' 'souvenir stills', not meant for publication, but smuggled out of China to the West. Several western observers in the International Safety Zone filmed evidence of the human tragedy surreptitiously, but their images did not appear in newsreels until several years later. The publication of the still and moving atrocity photographs were a kind of novelty, signaling a shift in what public decorum would now tolerate. A few years later, the bloodbath of World War II achieved a new reality. As Susan Sontag generalized, photographs were a species of rhetoric that reiterated, simplified, agitated and created

an illusion of consensus. Their daily pervasiveness during the conflict perhaps began to dull, if not corrupt the senses leading to our contemporary world of image saturation that Sontag believed diminishes morality and even numbs viewers to the point of indifference. If brutal images from Spain's civil war had begun this decade's cascade of horror in 1936, the Nanking images elevated shock effect. Incidentally, they helped to sell millions of magazines ([1], Sontag extended these thoughts in a provocative article in 2002 [2]).

By the 1930's photo-magazines were recognizable adjuncts of the news business in Europe, the Soviet Union and the United States. Two features about them are striking:

Photographs dominated their pages and the stories were generally simple or captions alone. They appealed to a readership that was, as an aggregate, young and more inclined to learn from pictures than from written sources. Second, these media tended to serve as mirrors and reinforcements of the dominant ideology of the country of origin. In Britain, for example, *Picture Post* came into existence in October 1938 and under the editorial guidance of Stefan Lorant and Tom Hopkinson, devoted itself to reflecting the national mood as the economically depressed nation slid toward the precipice of war while also appealing to the perennial whimsies of a young generation [3]. Its picture stories combined social comment with reportage to promote a kind of left-liberal humanitarianism to which the establishment had to adapt. Importantly, it introduced 'new ways of seeing' derived from radical publishing in Europe into the commercial culture that appealed to a new and growing audience. The multiple characteristics of picture magazines was their reductive simplicity, emotional appeal, and yet serious intent to inform. In the United States, *Life* and *Look* magazines shared these values as business ventures trying to build a readership of millions and to compete with newsreels to deliver the visual rhetoric of a world in action. Of course there were exceptions to the *Life* and *Look* approach. For example, Agee and Evans "Let Us Now Praise Famous Men", originally produced for *Fortune* magazine with governmental financing, was unique in its even-handed grappling of what Agee called the "cruel radiance of what is" of America's hard edged social realities. It was also reminiscent of the more sober *Illustrated America* and *Harper's Weekly* in the 1890s.

Edward Bernays and Walter Lippmann were influential thinkers in the 1920s who explored the role of public opinion in a democracy. The former was especially important in articulating the rules of modern advertising while the latter believed that in a democracy, an educated elite should direct and manipulate public opinion. Both built upon an existing understanding that emotions kindled by imagery tended to be an effective way to reach the millions of malleable citizens. Lippmann had said it was impossible to credibly inform the masses on important issues and then ask them to decide; decision was the job of the educated elite. John Grierson, a Scotsman from Britain who was studying public opinion in the United States at the University of Chicago, argued with Lippmann and claimed that half the equation was valid: it was possible, he believed, to use the emotional appeal of imagery to educate and motivate the individual in order to give him a the feeling of having a stake in society. Grierson returned to Britain to apply the power of visual rhetoric to documentary film. Besides informing and moving the viewer, he found one great strength of film was its appeal to the young, to the marginally educated, and to those semi-literate who did not read much at all. He understood that the typical citizen was more adrift than not, and that emotional imagery, in the form of the creative treatment of actuality, provided another form of factual education. He claimed the purpose of documentary was propaganda as education; its images could create democratic loyalties and intelligent understanding of the contemporary world. Grierson never denied that given a typical audience, documentary film, photojournalism and newsreel photography all exhibited a lack of intellectual rigor. They tended toward the sensational and sentimental, but those were the elements that impelled millions to act. In the complex world of the 1930s, there was a concerted struggle to use images to attract the loyalties of their citizens [4].

Whether they were images from the Spanish Civil War or Japanese depredations in Asia, the object of the new visual culture was to treat the unimagined experience and to render it emotional ([5], pp. 9–14, 47, 57, 62). Images of children figured often because they were blameless victims of social circumstances. As we shall see, the photograph of a child casualty in the 1937 Japanese bombardment of Shanghai's railway station evoked cognitive emotional empathy, moral awareness, and identification with alien victimization. That photo, whether candid or arranged, became so iconic, that today it stands as a lifelike sculpture that a visitor sees first when entering the Nanking Massacre Memorial Hall (Figure 1).

Figure 1. Baby Ping-Mei. Source: Karin Doerr.

Because Asia remained an alien bailiwick for western correspondents, there were not many still and moving images that had emerged from China, at war with Japan since 1931. If the American public's reaction to the still photographs from Nanking was generally one of shock, there seemed to be a somewhat indifferent long-term emotional involvement, due likely to inherent western racism or the remoteness of a conflict that was 3000 miles away. Archibald MacLeish once referred to such reaction as "the superstition of distance", being so far away, a viewer might conclude that violence, lies and murder on another continent were not believable ([5], p. 137). Racism, remoteness, incredulity, and paucity of correspondents are elements that anchor this study of the Nanking Atrocity's images.

As George Roeder Jr. stated in his seminal study of the American visual experience in World War II, it is difficult to assume precisely measurable or predictable effects of still and moving images upon public opinion in wartime America ([6], pp. 1–25, 81–104). The same applies prior to the war, although there was significant interest in visual depiction of world events, from Spain's civil war to Japanese militarism in Asia. In January 1938 the American public flocked to see to the newsreel footage of the Japanese bombing of the American cruiser *Panay* outside Nanking. It was a vicariously lived experience, and not long afterward, *Life* and *Look*'s still photographs of the Japanese depredations within the city probably added to growing American outrage at Japan ([7], pp. 3–14; [8]). In the context of the time, emotion triggered moral revulsion and both elements reinforced the humanist western tradition.

Still it took years and actual war for the smuggled Nanking atrocity film clips to circulate in American and Canadian newsreels. In the United States, as part of basic training, millions of recruits saw the *Why We Fight* series in which the virulent phrase the 'Rape of Nanking' became a popular slogan; millions more saw the same series in and out of theatres. In Canada, these and other film images were matched to a caricature of the duplicitous Japanese enemy as individually trustworthy yet collectively treacherous. The residual impact of these and the still photographs that Americans saw cannot be measured scientifically, but in the modernist tradition of moral integrity, their propaganda value was clear. Once war came, the American newsreel treatment of the Japanese aggressors was overtly racist; the Canadian propaganda effort, headed by John Grierson, used actual and manufactured atrocity footage to demonstrate fanatic Japanese militarism in order to strengthen Canadian national morale. The lasting (anti-Japanese racial) impression created by Canadian theatrical newsreels would impel the public, already bitter over Japanese abuse of Canadian prisoners of war, to mobilize in common purpose. If one American epithet referred to the Japanese racially as "buck-toothed," Canadians saw Chinese-staged (black propaganda) images of Japanese soldiers attacking women and bayonetting a baby. For both countries, the newsreels' use of gruesome Nanking images accompanied by a cascade of explanatory verbiage and moral invective reflected an informational world where news was as much about emotional imagery as about fact.

As applied to today's geopolitical tensions between China and Japan, images and words continue to resonate regarding events related to Nanking ([9], see [10]). The best-selling book by the late Chinese-American author, Iris Chang, echoed the Holocaust as a paradigm of memorial culture, referring to the Nanking tragedy in her title as 'the forgotten holocaust' ([11], see also [12]), causing instant controversy for its inaccurate association with the genocide of Europe's Jews [13,14]. In 2007–2008, the Chinese diaspora was reminded of the memory of the atrocity both in print and in three films by a Chinese, Japanese, and western filmmaker [15]. Debate continues to revolve around Japan's refusal to acknowledge fully and publicly its responsibility as a perpetrator. The impressment of Korean women as sex slaves is now a more familiar issue while Nanking is a less cited symbol of Japanese sexual ravages of Nanking women and the related brutality of its civilians. This may be because none of the world economic powers wishes old wounds to cause a breach in the thrust of today's consumerist world economy. Besides, China is very reluctant to allow the genie of public anger to percolate through its population, lest it lead to unintended political consequences for itself. This study concludes that the images and doctored footage from Nanking should be included as part of understanding a general cultural shift that accorded visual images a new respect. What remains difficult to gauge is the impact of exposure to these barbaric images. Then, they were part of the need to mobilize public opinion for war. Today, one fears they will not be used out of context as part of a growing public acceptance of, or indifference to the saturation of obscene images. If employed judiciously and in context, they may lead new generations of students of World War II to grasp the impact of visual imagery on mass populations.

2. Background

Japan had set up a puppet regime in Manchuria following its 1931 invasion. In July 1937, using a skirmish as a pretext to attack Shanghai, Japan launched a full scale invasion of China proper. Nationalist forces under Chiang Kai-Shek fought fiercely, but were defeated by aerial bombardment and superior Japanese troops. Chinese nationalist armies withdrew to the capital of Nanking, slowing the Japanese advance by using a scorched earth policy that left the enemy no food and little shelter, a policy that caused the Chinese civilian population much grief. The Japanese were surprised by the ferocity of the nationalist forces'

resistance and vowed revenge. Nanking's pre-invasion civilian population of one million was already reduced by up to three quarters before the Japanese assault by 200,000 troops. When they reached Nanking in December, the Chinese nationalists had laid waste key buildings and moved the capital to Chungking. Chiang withdrew the majority of his troops, leaving 75,000 to defend the city. As the invaders took and sealed off Nanking, 50,000 Japanese soldiers unleashed a campaign of unrestrained brutality. Emperor Hirohito's uncle, Prince Asaka, issued an order, "Kill All Captives". This encouraged lower echelon Japanese officers, short of supplies and anxious to build morale, to issue a policy of "Burn All, Loot All, Kill All".

Unobserved by world media and contradicting their own propaganda about kind Japanese soldiers, Japanese forces engaged in a murderous rampage until the end of January 1938. They sought out and machine-gunned or bayoneted tens of thousands of Chinese soldiers who had surrendered. The victims believed they were to be imprisoned, not shot by gunners hidden behind camouflaged walls. Thousands more civilian males of military age met a similar fate. In the final disgrace, troops raped indiscriminately some 20,000 Chinese women and girls, many of whom they murdered. The postwar Tokyo Tribunal established the "traditionalist" victim total of 300,000 [16] that has been accepted as valid ever since [17,18]. Japan denies responsibility for letting loose and ordering its soldiers to perpetrate war crimes [19-21].

In Nanking, journalists Hallett Abend and Frank Tillman Durdin of *The New York Times* reported on the unfolding tragedy on 10–11 December 1937. Their photographs depicted Chinese refugees, some waiting to be admitted to the "safe" International Safety Zone that foreign residents had established. As the city fell, journalists left Nanking to file their stories in Shanghai. They were not allowed to return until the end of January. So there were neither photographs nor western journalists to witness the fall of Nanking on 14 December. In fact, the news focus shifted dramatically on 13 December, when *The New York Times* reported that Japanese planes had attacked the American gunboat *Panay* not far from Nanking, resulting in the loss of several lives. The *Times*' photograph showed the *Panay* in its death throes after its crew and passengers had abandoned ship. For the next three weeks, the sinking of the *Panay* remained front page news in many U.S. newspapers [22]. On 15–17, 19–21, 25, 26, and 28 December, the lead stories in the *Times* dealt with Japan's insistence the *Panay* attack was an error, for which it proffered apologies (and eventual restitution). In the midst of the hysteria about the gunboat, Durdin filed a story from Shanghai on 17 December that news reports of atrocities at Nanking were like "…stories of war hundreds of years ago…when…a conquered city with its helpless inhabitants should be given over for twenty-four hours to the unbridled lust of the victors" ([23], p. 8). He concluded, "[the] terrorized population lives in fear of death, torture and robbery". On 18 December, under the banners "Butchery Marked Capture of Nanking" and "All Captives Slain", he reported the blanket looting and violation of women with a detailed description of Japanese depredations and rapes. He reported on 27 December that chaos and anarchy were facts in Japanese-occupied provinces; the story included a picture of Japanese troops marching to Nanking, but none from the city itself.

On the same day, *LIFE* published a pictorial essay on the *Panay*, using frames from the film that two newsreel photographers, Norman Alley and Eric Mayell, had shot while on board the doomed vessel. The ship sinking was the main story, and absence of dramatic photographs left the Nanking collapse a poor second. In the pre-television age, the public had developed an appetite for the visually stimulating experience of the newsreel (Figure 2).

The next day, the *Times* played up the *Panay* incident not only because American national honor had been compromised, but also because there was a film record of the attack on their neutral ship. The footage was speeding its way across the ocean and continent, soon to appear in newsreels. This raised significant public anticipation and on 30 December, newsreel theatres reported lines around the block.

This fed the *Panay* hysteria even more. *LIFE* reported that audiences allegedly broke into repeated applause after seeing the heroism of the ship's officers and civilians. Few knew that President Roosevelt had asked that the most damning footage, showing Japanese planes coming at the *Panay* at deck level, be censored. This was probably because negotiations regarding Japan's willingness to apologize and indemnify the United States were at a critical juncture. The footage was cut. Washington learned through code breaking that atrocities were occurring in Nanking but their source remained top secret. Without newsreel footage and correspondents' confirmation from Nanking, the public remained focused on the *Panay* spectacle (see [20,24]). For three weeks, newspapers in the United States made so much of the *Panay* sinking, that the Nanking Atrocity took a poor second in influencing pro-China and anti-Japan public opinion [25,26].

Figure 2. Sinking of the *SS Panay*. Source: The Denver Post/ Getty Images.

One can argue that the public's response to the *Panay* sinking took precedence because it was obvious that there was a shared national concern about the fate of one of its ships. It was only much later that stories appeared in mainstream print outlets like *Time*, *Reader's Digest* and *Far Eastern* filed by the western witnesses in the Nanking International Safety Zone [27,28]. By then, time had diminished the newsworthy immediacy of the event [29,30].

Henry Luce owned *LIFE, TIME* and *FORTUNE* magazines. Born in China to American missionary parents, he remained a lifelong champion of his birthplace and was probably America's most cogent pro-China spokesperson ([31], pp. 28, 30; [32,33]). He launched *LIFE* as a weekly news magazine in November 1936, with a strong emphasis on photojournalism. By 1938, he claimed its circulation was 17 million. With some prescience, a full week before the fall of Nanking, *LIFE* ran a cover picture of a Japanese soldier with a machine gun and the caption "Fatalist With Machine Gun". The issue featured Japan's conquest of Asia, with one story about Japanese soldiers, headlined "Japan's Army Slogs Down Asia on Schedule Time". To a long shot of Japanese soldiers marching, the caption remarked "happy at their work".

LOOK magazine, competing with the more popular *LIFE,* also celebrated America as a middle class experience. As a general-interest magazine, it cultivated a largely superficial approach to contemporary society, filling its pages with photographs of movie stars and casual or striking events. Because it took months to set up its biweekly issue, on 21 December 1937 *LOOK* ran a photomontage of the August 1937 bombing of Shanghai. It was a tragedy unrelated to the disaster unfolding in Nanking. Using frames of moving picture film shot by Hearst cameraman Wong Hai-Sheng, one shot became one of the most iconic of the prewar period, showing a baby sitting amidst the wreckage of a bombed out Shanghai railway station [34,35] (Figure 3). *LOOK*'s account of the barbarity of Japanese aerial warfare shocked the world. An estimated 136 million people saw the shot on newsreel screens or in print ([36], p. 260). United China Relief used this image to sell millions of Christmas cards and to raise millions of dollars for Chinese aid. Titled the Ping Mei card, the reverse side read: "This is Ping Mei—a child of China—…he is one of 50 million refugees who desperately need food, clothing, shelter, medical aid". *Time* magazine published it too, while appealing for money and underscoring the common interest and goals shared by the Chinese and Americans ([37], p. 55; [38,39]).

LOOK's use of emotive captions added weight to the frames of the bombed railway station. Its two-page feature titled "A Chinese Baby Survives an Air Raid" displayed five frames including the above mentioned event with a Chinese rescuer in the image (Figure 4).

A first picture explained the image of a Chinese man picking up the infant lying on the railroad tracks half hidden under the wreckage. A second still showed the man carrying the baby through the wreckage. A third photograph had him crossing the track to a platform while the caption explained the unannounced Japanese attack on this civilian facility. A fourth photograph depicted the infant, an older child standing next to his rescuer, the wreckage, and a dead child lying on the tracks nearby. The caption read: "…a child and man approach (above) to take the baby to a near-by first aid station. At the right lies the body of a 14-year-old boy, one of the 15 children found dead in the raid. In bombing Shanghai, Japan struck at China's largest, wealthiest city. Planes also have bombed Nanking, China's capital". The shameful image of the lone infant victim was evocative propaganda, a picture triggering a natural human response of revulsion. This iconic image helped construct a collective memory about the horrors of Japanese aggression and public discourse revolved around it as the Luce publishing empire helped keep it alive ([40], see [41,42]) (Figure 5).

Figure 3. Baby Ping-Mei. Source: *LOOK* Magazine.

Figure 4. Filmed images of baby Ping-Mei. Source: *LOOK* Magazine.

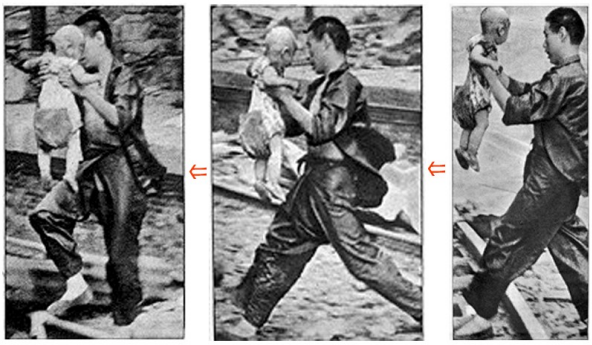

Figure 5. Rescue of baby Ping-Mei. Source: *LOOK* Magazine.

Situating the photograph in a related, but different context, a final photograph caption, titled "Lying on a Stretcher", depicted the infant on a sidewalk, receiving "first aid from a Chinese boy scout…" The text continued, "three weeks later, on the occasion of the Japanese bombing of Nanking, the governments of the U.S., Britain and France sent a note of protest to the Japanese government against the bombing of civilian populations. But aerial raids continue, with an increasing toll of dead. Chinese bombers and gunners, as well as Japanese, have been responsible for some of the deaths of innocent non-combatants—American and European as well as Oriental—in this undeclared war" (International News photographs [34]).

The undoctored newsreel footage indeed revealed a tragic and hopeful moment, the rescue of a baby after Japan bombed the railway station, intentionally or not. Yet the arrangement of film frames could lead a doubter or denier to claim that perhaps the entire event was staged for the camera or the baby was placed on the track after his rescue and then left to cry. The more significant historical fact remains that this child became the icon that spoke of Japan's careless attack on innocents in a civilian locale. One notes how different the film clip appears compared with the verbiage attached to the still frames.

While it is difficult to measure the impact of this visual news item in isolationist America, a Gallup Poll taken late in 1937 revealed that if the Ohio floods interested Americans most in the preceding year (28.3%), the Sino-Japanese war had practically the same effect (27.8%). By May 1939, seventeen months after the Nanking atrocities, polls revealed that sympathy for Chinese rose from 43% in August 1937 to 74% ([37], pp. 45, 46).

Having covered the *Panay* story in December exclusively, *LIFE* did not want to be scooped by *LOOK*, so its editors ran a grisly photograph on 10 January 1938: a severed Chinese head with a cigarette in its mouth (Figure 6).

The macabre text read in dramatic language that echoed *Time* magazine: "Chinese head whose owner was incorrigibly anti-Japanese, wedged in barbed wire barricade outside Nanking just before the city fell December 14…Quite possibly the worst holocaust [43] in modern history took place behind an official news silence in China's capture capital of Nanking between December 10 and 18…In the indescribable confusion the Japanese shot down everyone seen running or caught in a dark alley. In the safety zone 400 men were tied together and marched off to be shot. A few uninvestigated cases of rape were reported…The Japanese army permitted organized looting by its men presumably because its supplies are getting low…"

This atrocity photograph would not likely have been published if it had depicted a Caucasian victim [44]. The fact was that once World War II began, *Life* was so reluctant to publish images of American dead, that its first such photograph appeared only in September 1943, eleven months after the soldiers depicted had died in battle. *Life*'s editorial decision to let the Nanking photograph out reflected a double standard: the Oriental as Other and a feeling that many viewers would consider the sight of Orientals murdering each other as nothing more than a confirmation of Asian barbarism, as opposed to eliciting sympathy, horror or motivating action.

The article ignored the issue of widespread rape, choosing a photograph of a Chinese father carrying a baby mortally wounded by a Japanese bomb fragment and another of Chinese soldiers and civilians at a city gate with Japanese soldiers hauling carts of looted supplies. Its caption read, "the organized looting of Nanking would indicate that the Japanese Army Commissariat needs food more than prestige". A two-page photograph spread followed, of Nanking refugees on 5 December fleeing on a Yangtze riverboat. The text defended the Nationalists' scorched earth policy as the way to defeat the Japanese [45].

While both *LOOK* and *LIFE* had published photomontages reporting the military debacle in Nanking, because virtually all correspondents had been evacuated, there were no visuals conveying the scope of violations and breadth of the massacre. *LOOK* ran a feature on war propaganda on 15 February 1938 without defining what constituted war propaganda, good or bad. One page was devoted to Shanghai victims, depicting an old woman and a child, a mother nursing her infant, and another carrying her child through Shanghai streets. The pain of innocent civilians was clear, yet public decorum still demanded avoidance of the obscenity of death and blood.

On 18 April *LIFE* covered the Nanking massacre again with text that informed the American public of the depredations in detail. "These are the same soldiers who through last Christmas and New Year's treated Nanking, China's captured capital, to the most appalling mass atrocity since Genghis Khan. They raped Chinese women by the thousands, bayoneted and burned unarmed Chinese men alive in equal numbers, suffered the inevitable loss of morale. Since then the Japanese have been stopped and defeated by the Chinese" [46].

Figure 6. Severed Chinese head. Source: AP Photo.

The photograph of Japanese soldiers dozing harmlessly in a Chinese temple did nothing to illuminate or nuance the text. Three weeks later, *LIFE* displayed a series of photographs of Chinese child actors touring the countryside in a propaganda play about Chinese farmers uniting against a Japanese bully. In order to widen the propaganda effect of Chinese resistance, on 16 May, *LIFE* put a head shot of a determined looking Chinese soldier on its cover with the caption "Defender of China".

The accompanying feature boasted (incorrectly) that China was putting the Japanese army on the run and that China's odds to win were better than 50-50.

A powerful addition was a series of ten photographs of Japanese atrocities, frames taken from unattributed film footage. American missionary John Magee had filmed hospitalized victims surreptitiously in the International Safety Zone during the chaos, and fellow American John Fitch smuggled this footage out of China early in 1938. Fitch circulated it to limited American audiences to inform them of Japanese brutality, but exhausted by his efforts, he soon ceased his one-man campaign. Perhaps because events in distant Asia had less resonance than almost daily Eurocentric news, the film lay dormant until 1942, when portions of it appeared in a Canadian newsreel [47,48]. The above stills were preceded by the text: "the most dreadful picture of the rape of Nanking this amateur photographer could not take. He knew that if he filmed civilians being shot down or houses looted and burned, he would be arrested and his camera smashed. Besides he was too busy, like other foreign missionaries and doctors, saving what civilians he could. But for two weeks he saw an army completely out of control, raping, burning, killing and robbing and destroying without check. He saw a Japanese embassy completely powerless to restrain its own men. In foreign hospitals in and around Nanking he saw hundreds of innocent victims of 'totalitarian war".

Accompanying each photograph was an explanation: 1. Wounded Chinese in primitive basket who was transported to emergency facility. 2. Survivor of family of 11 standing among bodies 3.Wounded woman whose husband and child were killed. 4. Disfigured burned man, tied with 100 others, doused with gasoline. 5. Man with bayonet gashes, who refused to yield his women to Japanese. 6. Woman nearly decapitated 7. A 14-year-old boy beaten with an iron bar. 8. Man (police) struck with axe, recovering in hospital after feigning death by firing squad. 9. A 19-year old woman stabbed 29 times, later had a miscarriage in a refugee hospital. 10. Body left to rot in roadside pond.

Six months after the fact, these were among the most inflammatory photographs of the Asian conflict ever shown to the American public and an early use of the term "Rape of Nanking". These must be added to evidence that was steering (a still largely isolationist) United States public opinion to a stronger pro-Chinese/anti-Japanese position. The next week, a photograph essay described Chinese troops going into action and achieving a victory; a week after that, war photographer Robert Capa's photographs depicted Chinese civilians witnessing air battles over the city of Hankow. Capa's images of war would become icons of the era even though these photographs of a mourning Chinese mother and the city of Canton under fierce Japanese bombardment were not reproduced in the millions as were those of baby Ping Mei. The text predicted accurately that these images of dead and wounded and a city destroyed were curtain raisers to the next war in Europe [49]. *LIFE* had shot its bolt as these were the last Nanking references in 1938. There were eight more issues in which China was mentioned, but nothing was as sensational as the Nanking photographs [50].

Notwithstanding *LIFE*'s larger readership, in November it was *LOOK* that delivered the most graphic photographs of Japanese outrages (probably in Nanking), including the Japanese bayoneting of Chinese prisoners of war while soldiers watched (Figure 7). The *LOOK* captions were as graphic as the pictures. Under the headline "Killing For *Fun*!" the text read: "Hands Tied, Chinese prisoners are used as live targets for bayonets of Japanese recruits. In the foreground a captive is being tormented. Another (left rear) is being stabbed to death. A third (center) has just received the death thrust. A fourth (rear) is being driven into the pit" [51,52]. Additional text on the page charged the Japanese with butchering Chinese and burying them alive, merely for amusement, or to inspire raw recruits to kill. The writer explained:

> "We are sending you some pictures of killers in the act of killing. We have plenty of hard boiled correspondents here—Steele of the *Chicago Tribune*, Durdin of the *New York Times*, Beldon, an ex-United Press reporter, Victor Keen of the *New York Herald Tribune*, and others and all of them reckoned the pictures to be the worst things they had ever seen in China, bombing aftermaths and battlefields thrown in.
>
> The pictures were taken in Nanking and Soochow recently, that can be judged by the fact that the men are in their summer uniforms. In other words, the killings happened at least six months after the occupation of those cities, when some blood lust, however bad, was to be expected. Thus, these pictures must come under the heading of diversion, or else the executions were staged to put the killer instinct into freshly drafted troops.
>
> The Japanese soldier-photographers sent the films to Shanghai for developing and printing. They sent them to a Japanese-owned shop and Chinese employees did the natural thing in exceeding the original printing order. Hence these pictures found the light.
>
> These Sons of Heaven went one worse than the

Romans who, even if they sent their gladiators into the arena wearing half-inch armor, at least gave their victims a short sword and a sporting chance. As you will perceive, all these Chinese soldiers and civilians were led into the killing pit with their arms pinioned."

Captions explained that these were Japanese recruits at bayonet drill. Using Chinese prisoners as targets was a practice that was considered the proper way to season newcomers. This photograph was among sixteen souvenir photographs taken by Japanese soldiers. Duplicated secretly, these grisly images made their way to the West eventually and the entire set was used at the postwar Nanking War Crimes Trial in Tokyo (1946–1948).

On the following page, a photograph depicted Japanese soldiers watching execution of Chinese men. The caption read: "Rivers Run Red as Chinese are executed beside a stream. Several hundred Japanese soldiers are gathered around, watching the slaughter. The man in the foreground is toppling over dead. His head may be seen in the crook of his arm. The next victim is in place" (Figure 8).

A second picture claimed, "Five Chinese Prisoners are Buried Alive, in this, one of the most gruesome of all wartime pictures. Enraged by the stoic calm with which the Chinese defenders are meeting their attack, the Japanese are more determined than ever to bring them to their knees. This war, now in its third year, is one of the most brutal in history" (Figure 9).

A larger photograph depicted Japanese soldiers with fixed bayonets aimed at two bound Chinese, one tall, one short (Figure 10). The text stated: "The Big Boy Was Beheaded because he stepped on a telephone wire, but the Japanese soldiers spared the life of the little fellow. Because of a shortage of food, many prisoners in the bloody arena are beheaded. Both the Japanese and Chinese face death with a calmness astonishing to westerners" [51].

Figure 7. Japanese soldiers bayonet Chinese prisoners. Source: Keystone/Getty Images.

Figure 8. Beheading a Chinese soldier. Source: Robyn Beck/Getty Images.

Figure 9. Burying Chinese prisoners alive. Source: Keystone/Getty Images.

Figure 10. Japanese abuse young Chinese captives. Source: *LOOK* Magazine.

Another image of live burials appeared in the journal *Pictorial Review* with a story by Betty Graham titled, "Hundreds of Thousands Slaughtered in New Wave of Bestial Jap Atrocities" [53-56]. The photographs' impact should be included in explaining a Gallup Poll rise in anti-Japanese American public opinion [57]. If a photo's visual syntax is universally comprehensible, it is difficult to assert what the viewers' possible re-

sponse to atrocity photographs would have been: perhaps a combination of horror, anger and to a lesser degree in isolationist America, a desire to punish the perpetrators [7,58-61]. A recent historiographical book on the moral, political and educational aspects of the atrocity surveyed Chinese, Japanese and transnational authors, but did not attempt to gauge the impact on public opinion that pictures like these had when circulated in the millions [62].

Nanking disappeared from public discourse after 1938. Some found the atrocity stories too shocking, believing they were similar to (untruthful) black propaganda of World War I. Others had inverse attitudes: sympathy for the Chinese in Asia and prejudice to Chinese living in their city. Perhaps because of squeamishness about rape and barbarism ([10], p. 16; [63-69]), or because they violated standards of decency or because of general provincialism, the Nanking horror slipped from public consciousness until America was at war. Japan's attack on Pearl Harbor in 1941 became America's rallying cry. Only then did the 'Rape of Nanking' join wartime iconography [70,71].

In contrast to the United States, Canada had no weekly national pictorial magazine. Its primary national magazine, *Maclean's*, said nothing about the Nanking atrocity. Only in February 1938, did a columnist from London mention Japanese-British relations and a Japanese diplomat's cynical comment referring to *Chinese* aggression in Shanghai. The emphasis of *Maclean's* was exclusively Eurocentric, with a single reference in March to the possibility of war coming across the Pacific [72]. Taking *The Gazette* (*Montreal)* as a typical English Canadian newspaper, its coverage of the fall of Nanking had no photographs, was based on the Durdin and Abend articles in the *New York Times*, and only once in December spoke of the Japanese soldiers' "breakdown of discipline". Late in January, in a dispatch from Shanghai headlined "Nanking Captors Run Amok", Abend claimed his sources were based on consular reports whose contents about assaults on women and very young girls were "actually unprintable". A day later, an editorial reiterated the *Times*' story and Japanese military authorities' admission that the depredations were "blunders". As shocking as this singular news coverage was, the Canadian press did not purchase the extant images to follow-up the story. In the linguistic and cultural gulf that existed between Asia and Canada, the long history of ethnocentricity and conservatism demonstrated the failure of Nanking to register as anything more than a tragic fact [73].

3. American Newsreels and Nanking

One of the more puzzling elements surrounding the Nanking Atrocity is the American newsreels' failure to cover the event. Henry Luce's *The March of Time*, the premier newsreel series of its kind, ignored China in prewar issues, other than a March 1936 mention of Japan's 1931 invasion of Manchuria. Typically, its narration used "other" voices to mouth potentially hazardous judgments and one issue commented about militant Japan: "but as Japan's militarists march on behind their Emperor, observers may well wonder what a nation whose war dogs go mad at home might do if allowed to run loose throughout the world" ([74], pp. 85, 86). In December 1937, after the Japanese sinking of the *USS Panay,* nationalist rhetoric inflamed anti-Japanese public opinion.

The *March of Time* series was a barometer of the growing influence of moving images upon news. It became the most widely distributed newsreel in the United States with an audience of 12 million viewers in 5236 theatres in 168 cities ([74], pp. 138, 154). If there was a dearth of, or no footage available, series director Louis de Rochemont used re-enactment freely ([75]; see [74], pp. 134, 228, 237). In a prewar issue titled "Japan-Master of the Orient", the narrator reviewed Japan's "record of shameful unprovoked aggression" without alluding to the horrors of Nanking. Hesitant to condemn the whole of Japan, he stated, "sober Japanese wonder fearfully how long the patience of the great western nations will brook this lawless threat to the peace of the world" ([74], p. 241). In December 1941 "Battlefields of the Pacific" dealt with Japanese military aggression generally. In fact, between January 1942 and August 1945, the series analyzed the Pacific war in only four issues, devoting one general newsreel to China. *The March of Time* mentioned Nanking just once in 1942. Ignoring China echoed prewar American isolationist sentiment, owner Henry Luce's *laisser faire* policy toward the series, its Eurocentric outlook, or Louis de Rochemont's indifference toward the Chinese. Not surprisingly, after December 1941, American interest in the Pacific revolved around concern for American servicemen exclusively ([76]; see [74], pp. 134, 254, 276).

In contrast, a sobering treatment of the Japanese enemy occurred in one of the War Department's propaganda series *Why We Fight*, made under the supervision of celebrated Hollywood director Frank Capra. In "The Battle of China" (1944), John Magee's Nanking footage was integrated into Chinese-manufactured atrocity images that had appeared in an earlier Canadian newsreel from the National Film Board. Actuality images included a point blank execution of two bound Chinese prisoners, accompanied by the following narration, "but again, Japanese power was too great and after a battle lasting but a few days, the city fell to the invaders. In their occupation of Nanking, the Japs outdid themselves in barbarism. The Japanese soldiers went berserk. They raped and tortured. They killed and butchered. In one of the bloodiest massacres in recorded history, they murdered 40,000 men women and children…" Thus began the Chinese death toll debate ([77], see [54]), but the appalling images showed victims who had been stabbed, raped, set on fire or nearly beheaded ([78]; see [20], pp. 156–157).

The graphic narration spared nothing. "…But those who lived might better have died, for the horror of their twisted and torn bodies was worse than death… This nightmare of cruelty was all the more horrible because it was deliberately planned by the Japanese high command to tear the heart out of the Chinese people once and forever…" [79].

One can surmise how engaging and effective this inflammatory imagery was, even if the audience for this film was much smaller than the first film in this series "Prelude to War", which was mandatory viewing for millions of American recruits. Released in the fall of 1944, "The Battle of China" was withdrawn briefly, and then reissued midway through 1945, reaching an audience of 3.75 million. One critic has labeled it Hollywood fairy-tale propaganda that strained credibility because it ignored Mao's communist armies (Communism was still a forbidden word in mainstream American media) and pretended that China was expelling the Japanese invader ([80], pp. 176, 184).

The images trigger revulsion, but the propaganda objective was to engage viewers to believe that the Chinese themselves would defeat the enemy. The narration boasted, "…and then it happened. That which Sun Yat Sen had dreamed of, that which Chiang Kai-Shek had toiled for, that which is stronger than stone walls that had surrounded China: the will to resist. In their last bloody blow the Japanese had accomplished that which four thousand years had failed to bring into being—a united China…" Accompanying this verbiage were pictures of Chinese leaders exhorting their people, reiterating the message of unity. The race card was played more viciously as the narration concluded that Japan planned to conquer North America and the world when "the Germans would join with their buck-toothed pals coming over from Siberia" [80]. If nothing else, racism could be counted on to generate emotion.

4. Canadian Newsreels and Asia

For its part, Canada's military engagement in Asia had proven to be disastrous in 1941, with the fall of Hong Kong and the ignominious surrender of two ill trained and unseasoned Canadian battalions ([81]; see [82], p. 109). Learning of Japanese brutality toward all prisoners of war, Canada's film propaganda chief, John Grierson, tried to rally morale without stoking racist fires. On the heels of these military fiascos, this was a difficult task, since the Canadian populace largely approved the government's racially motivated removal of Japanese Canadians from coastal British Columbia in 1942 ([83]; see [84], pp. 82–96).

Invited to Canada in 1939 to establish and then lead the National Film Board, Grierson produced morale building theatrical and nontheatrical short films monthly to inform citizens and soldiers. Emphasizing propaganda as "education", the films systematically shaped perceptions, manipulated cognitions and directed behavior ([85], pp. 11, 78–89). Film Board productions included four theatrical issues on Asia from 1942 to 1944, *Inside Fighting China*, *The Mask of Nippon*, *When Asia Speaks* and *Fortress Japan*. These newsreels, reaching two million at home and up to ten million internationally, defined Canada's Asian propaganda strategy: to vilify Japanese aggression, not the Japanese people. In July 1942 *Inside Fighting China* showed the film clip (described above) of Japanese executing Chinese captives. Lorne Greene, the paternal voice of democracy in Canada's wartime newsreels, asserted soberly that the Japanese were using liquid fire, gas, and bacterial warfare to butcher civilians and soldiers. The narration concluded that China, with communists and nationalists united, was destroying the myth of Nippon the invulnerable. There was no mention of the Nanking atrocity ([4], pp. 215–216, 224–225).

Grierson's propaganda approach was ideologically simple: portray the Japanese as individually trustworthy but collectively treacherous. This theme was central to *The Mask of Nippon*, in September 1942. The film began with a crude physical characterization of Japanese soldiers as "little men, quick and wiry; their uniforms slovenly, their faces, even in the heat of battle, tawny masks, black, expressionless". There followed a series of quick cuts to Japanese troops in combat, and a shot of Japanese soldiers brutalizing a crowd of Chinese civilians, with one seizing and rough-handling a mother and child. Then another threw the child into the air as the other's bayonet pitched the child's body out of the frame. There followed clips of bound Chinese prisoners being thrown into a pit, being buried alive, shot at point blank range, and finally civilians dragging a corpse, literally in ribbons. The narration was accompanied by a chorus of female screams, heightened by a high pitched Oriental flute. This was the most atrocity-filled war footage ever shown to Canadians. The crowd scene, the burying alive of prisoners, the woman, and the bayoneted child were in fact staged, taken from a Chinese-made propaganda film and inserted as actuality footage along with segments of the Magee film. Mixing black (staged) and white (authentic) propaganda was allowable if the result articulated the true larger picture. The narration made reference neither to Nanking nor to the provenance of the footage. The evocative impact of soldiers bayoneting the child remained indelible as audiences would have absorbed the whole as "authentic". A number of stills from the staged sequences continue today to be used, (probably unknowingly), as actuality photographs from Nanking. A wall of verbiage, accompanied by stock iconography of Japanese cultural images, reminded the viewer that the enemy was dangerous, but beatable psychologically and militarily. In July 1944 *Fortress Japan* gave an account of the Allied advance on beleaguered Japan, using footage of dead Japanese soldiers to demonstrate that the Allied drive would

break Japan's militaristic spirit: "and so, a nation which has ever held life cheap, prepares to practice once again its ancient arts of death…" Tom Daly, the editor, defended these Asia films, noting that they did not substitute emotional racism for a true thing nor did they deny the Japanese were intelligent people. He and director/writer Stuart Legg had no misgivings about using the Chinese-manufactured (black) propaganda to drive home the point. Black propaganda is usually defined as material where the role of the authorities is deliberately obscured, or where it appears to come from the people at which it is aimed. Audiences had no idea that the most brutal images were staged sequences ([4], pp. 219–220) (Figure 11).

Figure 11. 'Child' (a doll) bayoneted in Chinese propaganda film. Source: National Film Board of Canada.

5. Japanese Propaganda and the Nanking Atrocity

If Canada's propaganda tried to keep truth as its touchstone, the Japanese had no qualms about employing black propaganda in their sophisticated campaign to deny the Nanking atrocity. The Japanese public learned of the fall and occupation of Nanking through jingoist headlines and newsreel pictures of the victory parade led by their triumphant general. *The Japan Advertiser* boasted of a barbaric contest between two lieutenants as to who could behead more Chinese prisoners. The tally of 106 to 105 led them to call lightheartedly for a new contest to resolve which of them to name the "winner". After the war, the Allied Wartime Tribunal used the celebrated "killing contest" to condemn the two to hanging for war crimes ([20], pp. 170–171; [86]; see also [54], pp. 141, 147). Many in this culture that celebrated "bushido" never understood why (Figure 12).

Sanitized Japanese newsreels showed troops fighting their way into Nanking, followed by "Bonsai" victory salutes on the city walls. To offset rumors at home of civilian atrocities, Tokyo invited Japanese visitors to tour the city in January 1938. The tourists gave sweets to Chinese children and saw nothing of the ongoing rape and carnage. Japanese newsmen took pictures of "spontaneous" New-Year's celebrations in which gleeful residents also welcomed Japanese soldiers who handed out sweets (Figure 13). Other photographs depicted children receiving care from a Japanese medical doctor.

Figure 12. Japanese soldiers' killing contest. Source: The Japan Advertiser.

Figure 13. Japanese soldiers handing out sweets to Chinese children. Source: The Japan Advertiser.

Figure 14. Japanese propaganda in China. Source: Unknown Japanese.

A few reports had the audacity to declare that the Chinese, not the Japanese, were responsible for the looting, raping and burning. The occupying forces also dropped leaflets promising food and clothing if the Chinese returned to their homes. Thousands of hopeful victims left refugee camps in response to a leaflet featuring a Japanese soldier holding a Chinese child in his arms and distributing rice by the bagful (Figure 14). Black propaganda beckoned Chinese to return to their homes to receive food and clothing. Undisciplined Japanese troops then victimized many who returned [87].

6. Conclusion

This study has argued that because the world was not yet buried in a surfeit of images, pictures commanded a degree of moral authority. Decades later, a stark postmodernist view articulated by Susan Sontag insisted that photographs from "the slaughter bench of history" do not necessarily induce pathos and sentiment, nor are they the source of ethical and political knowledge. She divorced moral and ethical judgment from the experience of viewing, in part because of the sheer volume of images in our daily lives. In contrast, John Taylor denies that the surfeit of images provokes weariness and distrust, claiming instead that the very awfulness of images can and does define civility. Modernism needs reconsideration, he believes, and through it we remember the importance of images' connection to morality ([59], pp. 1–11).

Observing the still photographs and newsreels devoted to Japanese depredations in Nanking, a number of salient points emerge. In the relatively new practice of twentieth century mass spectatorship, there came into being a new public discourse and public sphere in which media-generated imagery operated on both conscious and unconscious levels ([61], pp. 112, 113). It is not possible to state with certainty the effect of the images upon the millions who experienced them but it is likely that the widely circulated still photographs in *LIFE* and *LOOK* contributed to changing or confirming public opinion about militant Japan. Iconic photographs such as those of baby Ping Mei in the ruins of a Shanghai railway station or Japanese soldiers bayoneting Chinese POWs compelled a degree of moral awareness. Though the event was about far away alien victimization, the pain and identification they projected were, we believe, unmistakable. In 1937 the world was on the brink of conflagration and even if their impact is dulled by context and time, their power to summon humanist impulses stands in contrast to Sontag's insistence that images blunt morality and serve to promote pathos and sentiment ([39], pp. 43, 44, 175, 176).

Earlier we observed the prewar sinking of the American gunboat *Panay.* It had a probable catalytic effect on the public that interpreted it emotionally as a national affront, not only because it was captured on film, but also because the press reinforced its importance for weeks. The lines of patrons at newsreel theatres demonstrated the American public's taste for "news" as images, as sentiment, and even in the prewar world, as a form of jingoist sport. Whatever the motivation, later public opinion surveys demonstrated American sympathies were measurably pro-China and anti-Japan following exposure to the visual and print information.

That said, the trauma of being a combatant in war produced a willingness in both the United States and Canada to use images as public opinion leaders employing white and black propaganda. One can appreciate how the "Rape of Nanking", synonymous with Japanese barbarity, assumed its iconic role. The 1942 and 1944 newsreel pictures of the Nanking atrocities reinforced anti-Japanese public opinion at the least. If John Magee's actuality footage from Nanking and staged images of panicked civilians in *The March of Time* stirred American audiences to demand revenge, so too did the lurid theatrical bayoneting of the child in Canada's newsreel, *The Mask of Nippon*. But propaganda chief John Grierson insisted that such images should be balanced by showing the human side of the Japanese; Canada's propaganda goal was to ensure that patterns of peace, not revenge, ultimately prevailed ([88], pp. 140, 142, 143, 150, 151; see also [89], pp. 79–92). Being wartime, no one went on record to protest suspected image manipulation, a clear suspicion if one analyzes the perfectly positioned camera and actors. In Japan, the "killing contest" aside, (citizens in Japan's militarist society accepted the warrior's cliché Kill or Be Killed) the Japanese produced their own black propaganda to convince citizens of their humane treatment of the Chinese noncombatant population. One may conclude that if such images had their intended salutary effect, later evidence demonstrates they were dishonest to the core.

One of the great tragedies in recounting the Nanking event is the issue of females being "taken away" as witness Lewis Smythe expressed it so delicately in 1938. The "comfort women" controversy of the 1990s, triggered by current feminist discourse, raised the issue of sexual slavery and sexual assault, but little about the history that led to it. The fact that the Japanese command never planned for the sexual needs of its occupying troops was one catalyst that led to widespread rape ([13], pp. 115–148). Subsequently, Japan attached (mainly Korean) "comfort women" to its troops to prevent a similar catastrophe from recurring. As well, such depredations were meant to humiliate the conquered populations. Today these surviving Korean females wait for a full public apology. Years later, Japanese servicemen's 'souvenir photographs' of the female depredations served to demonstrate how powerful a photograph can be in terms of its ability to enrage civilized consciousness, no matter what the citizenship of the beholder is, and to remind one that

suppression of the transgression of wartime rape is too often ignored in consideration of public propriety. Today the photograph below of this shamefully humiliated victim stands in a prominent place in the Nanjing Massacre Memorial Hall (Figure 15).

One is reminded of John Taylor's reference to how images of horror function cognitively as a peculiar blend of fear and disgust. They are both an affront and threat that people may share. Citing John Keane, he reminds us of how exposure to horror functions to keep memories alive, to heighten awareness of current cruelties, to raise issues about whether violence is justified, and to encourage remedies for savagery. At the same time one never knows if viewers respond to pictures and film with curiosity, esthetic distance or emotional involvement. What we have demonstrated in this research is that preserved images become part of historical memory [90-92]. *Life* and *Look*'s publication of atrocious photographs posed the question of what standard was used to decide what was proper to see. It is clear that a regular diet of such images would have provoked reactions of disgust, hence the media themselves determined taste and tone. This study has documented their chronology and contribution to historical public discourse. Once war came, the moving images of Nanking served to remind the public that the enemy's acts had been hateful and that common action would lead to Japan's defeat. Republishing these images in 2014 is meant to waken the public from moral slumber, indifference and historical amnesia and to remind present and future perpetrators around the world that there must be a reckoning for their crimes against humanity.

Why did China let Nanking slip from postwar public scrutiny? A faltering Nationalist China ignored the atrocity in exchange for Japanese political support in the late 1940s; after the Communists formed China's government in 1949, their own political expediency demanded that the shame be ignored. Since the 1990s, circulation of Nanking atrocity photographs has revitalized the event's iconic status. This relates to the emergence of a confident China, where nationalists at home and abroad demand historical justice, as well as to surviving Korean "comfort women" who claim the same. Japan's revisionists refuse to face history squarely because this would require that nation to relinquish its postwar status as victim. Contemporary conservative guardians continue to ignore the Nanking atrocity in Japan's history books. Japanese denial of scope and depth aside, the Nanking outrage serves a positive propaganda function of reminding governments that they are answerable for the acts of their soldiers. New generations of soldiers and civilian collaborators need to know that if they are told to obey and to ignore their conscience, they must, in the long run, answer in the court of posterity.

The absence of official postwar Japanese regret or willingness to pay reparations can be explained by Cold War politics that made it easier for public memory to lapse ([20], pp. 209–214; [93,94]). Iris Chang concluded that Japan's refusal to accept responsibility for the victims of Nanking was a reflection of human nature: she thought unspeakable acts become banalities if they occur far enough away to pose no personal threat ([20], p. 221; [95,96]). That is one sad conclusion to draw about the Japanese war in Asia. American postwar interest in Japan had more to do with establishing a constitution and democracy than with accounting for Japanese brutality in China. As historians, some perpetrators, and many in the public now demand an explanation for this historical crime, one recalls Holocaust survivor Elie Wiesel's sober words "Whoever hears a witness to the Holocaust becomes a witness and messenger too" [97]. The unleashing of the Japanese soldiers on Nanking should not be allowed to stand as only another sad statistic of human misery. We believe the images referred to in this study impose rather than create a space for meanings ([98], pp. 3–5) and serve a double purpose: they monumentalize shame until Japan accepts its moral responsibility, after which proper mourning and the integration of the collective memory of both Japan and China will be satisfied. Second, they may also serve to help Japan adopt the politics of atonement officially. If this results in some lingering private resentment, at the very least, it will at last force a fair and ongoing public dialogue between Asia's two Great Powers.

Figure 15. The humiliation of sexually ravaged women. Source: Nanjing Massacre Memorial Hall.

References and Notes

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2. Looking at War. The New Yorker. 9 December 2002. pp. 82–98. Available from: www.college.columbia.edu/core/files/pages/Sontag-essay.pdf (accessed on 18 November 2013).
3. Hopkinson T, editor. Picture Post 1938–50. Harmondsworth, UK: Penguin; 1970.
4. Evans G. John Grierson and the National Film Board: The Politics of Wartime Propaganda 1939–1945. Toronto, Canada: University of Toronto Press; 1984.
5. Stott W. Documentary Expression and Thirties America. New York, NY, USA: Oxford University Press; 1978.
6. Roeder Jr G. The Censored War. New Haven, CT, USA: Yale University Press; 1993.
7. Linfield S. The Cruel Radiance. Chicago, IL, USA: University of Chicago; 2010.
8. Linfield embraces the power of photography and takes issue with Sontag's criticism of the medium's deep emotional bite. Linfield rebukes intellectuals like Barthes, Berger and key postmodernists who probed an image's spectacle, emotion and absence of context.
9. A contemporary variation of this is China's interest to use the event to promote nationalism while simultaneously reining in overenthusiastic activists.
10. Fogel JA, editor. The Nanjing Massacre in History and Historiography. Berkeley, CA, USA: University of California Press; 2000.
11. Chang I. The Rape of Nanking: The Forgotten Holocaust of World War II. New York, NY, USA: Basic Books; 1997.
12. Yoshida T. The Making of the "Rape of Nanking": History and Memory in Japan, China and the United States. New York, NY, USA: Oxford University Press; 2006.
13. Wakabayashi BT, editor. The Nanking Atrocity 1937–38: Complicating the Picture. New York, NY, USA: Berghahn Books; 2007.
14. This book of contributions by sixteen authors deals with an overview of the event, the debate over victim figures, perpetrators and collaborators, and the ongoing issue of Japanese denial. Its detailed methodology points the way for other researchers to follow. The Japanese deniers' argument is that most Chinese civilian deaths resulted from justifiable legal battlefield actions against unlawful combatants who were armed or had access to arms in the Nanking Safety Zone. They maintain (ignoring the illegal invasion and occupation of China) that no deliberate massacre took place for which Japan must apologize or pay compensation (pp. 359–360). Wakabayashi's own conclusion of 40,000 to 200,000 victims from August to December 1937 reduces the issue to an argument about numbers (p. 384). Numerically speaking, the Nanking count of between 40,000 and 369,000 victims pales next to the Jewish losses of between 5.2 and 5.8 million. If the Japanese unleashed deadly weaponry against Nanking's prisoners of war and committed rape and pillage of numerous civilians, the Germans committed wholesale industrial murder against their victims, root and branch. An historical irony is that in1938, *LIFE* magazine referred to the tragedy of Nanking as a "holocaust", seven years before that word took on its contemporary meaning referring to the judeocide.

15. Nanking, Christmas 1937 by Yim Ho (Hong Kong), *The Truth About Nanjing* by Satoru Mizushima (Japan), and *Nanking* by Bill Gutentag and Dan Sturman (United States). These films present the subject from each national optic. *Lust, Caution* by Ang Lee, (Hai Sheng Productions, 2007) is a romantic drama set during the occupation of Shanghai. See also *City of Life and Death* (2009) which is suffused with the violence, death and sexual depredations that accompanied the Rape of Nanking.

16. The postwar Tokyo War Crimes Trial (1947) established a total number of 300,000 killed and 20,000 raped. Present research estimates of Chinese murdered vary widely from 40,000 (by Japanese authors) to over 369,000 (by Chinese authors). Rapes are even more difficult to document because of the shame and stigma associated with victims of this crime.

17. Masahiro Yamamoto [18] discusses the two approaches that now characterize interpretations of the Rape of Nanking as traditionalist and revisionist. He spends considerable effort detailing extant figures on the killings, but concludes that wide divergences between Japanese and other sources keep from bringing both sides to closure. He spends much less energy discussing the rapes and other civilian depredations (pp. 135–138) than he does arguing about numbers killed. He circumvents the elemental question of Japanese aggression in China.

18. Yamamoto M. Nanking, Anatomy of an Atrocity. Westport, CT, USA: Praeger; 2000.

19. In The Name of the Emperor, a National Film Board of Canada production in 1998, directed by Hong Kong filmmakers Christine Choy and Nancy Tong. A number of Japanese veterans confess to committing pillage, rape and murder on orders from their officers. This makes the issue of numbers far less important than the issue of agency. One has only to follow the chain of command to realize that the Rape of Nanking is undoubtedly a war crime that was official (unwritten until documents prove otherwise) policy. NFB C9197 186 [no longer in NFB distribution]. Several perpetrators admitted their war crimes in this film. Iris Chang transcribed several of these admissions in her essay "The Rape of Nanking" [20]. Similar ground is covered in the docudrama Iris Chang: The Rape of Nanking [21].

20. Chang I. The Rape of Nanking. In: Barstow AL, editor. War's Dirty Secret: Rape Prostitution and Other Crimes against Women. Cleveland, OH, USA: The Pilgrim Press; 2000. pp. 46–56.

21. Spahic B, Pick A, directors. Iris Chang: The Rape of Nanking. Toronto, Canada: Real to Reel Productions; 2007.

22. The *Panay* story also played out nationally in the *San Francisco Chronicle*, the *Los Angeles Times*, the *Des Moines Register*, the *Omaha World Herald*, the *Dallas News*, the *Little Rock Gazette*, the *Boise Idaho Statesman*, the *Phoenix Arizona Republican* and the *Kansas City Star*.

23. The New York Times. 17 December 1937.

24. MacDonald C. 'Kill All, Burn All, Loot All': The Nanking Massacre of December 1937 and Japanese Policy in China. In: Levene M, Roberts P, editors. The Massacre in History. New York, NY, USA: Berghahn Books; 1999. pp. 223–246.

25. Perlmutter [26] notes that by November, 1938, United States direct aid to China grew from $20 million to $100 million. As well, national support for an embargo against Japan grew (pp. 5–6).

26. Perlmutter D. Photojournalism and Foreign Policy. Westport, CT, USA: Praeger; 1998.

27. Brook T, editor. Documents on the Rape of Nanking. Ann Arbor, MI, USA: Ann Arbor Paperbacks; 1999.

28. Timothy Brook [27] contains much cogent evidence for the atrocities.

29. The newsreel footage of the sinking of the Panay is available free online as [30].

30. The Bombing of the USS Panay, 1938. Available from: https://archive.org/details/SinkingOfUssPanay (accessed on 18 November 2013).

31. Herzstein R. Henry R. Luce, Time and the American Crusade in Asia. New York, NY, USA: Cambridge University Press; 2005.

32. Perlmutter D. Picturing China in American Press: Visual Portrayal of Sino-American Relations in Time Magazine 1949–1973. Lanham, MA, USA: Lexington Books; 2007.

33. The Luce press' portrayal of China as victim of Japanese aggression spurred the United States to enact embargoes on sales of critical resources such as oil, which set the stage for Japan's attack on Pearl Harbor (xviii).

34. LOOK magazine. 21 December 1937. pp. 52–53.

35. A full description of the photographs and captions follows. Title: "A Chinese Baby Survives an Air Raid", Text: "On August 28, while hundreds of terrified Chinese huddled in Shanghai's South Station, 16 Japanese planes bombed the building. Two hundred were killed. The dramatic rescue of a child survivor is pictured here."; Photo: "Chinese man picks up baby found lying on the railroad track at bombardment of train station in August 1937", Text: "An Infant Survivor of the Japanese bombardment of Shanghai's South Station was found lying on the railroad tracks half hidden under the wreckage. Here a young Chinese man picks up the infant, starts for the opposite platform"; Photo: "Man with baby picking way through wreckage", Text: "The Baby Howls as his rescuer picks his way through the wreckage. When the bombs struck South Station it was jammed with poor Chinese waiting to escape war-torn Shanghai on a train to the south. Two hundred were killed"; Photo: "Man crossing tracks nearing platform". Text: "They Near the Platform…Two squadrons of 8 planes each bombed the station. At the same time, they bombed Nantoa, a native residential section of South Shanghai. A civilian section, Nantoa was totally unprepared for the raid and the planes flew away unharmed after the bombing. Previously the Japanese had announced they might issue a warning if Nantoa were to be bombed, but the actual attack came without warning"; Photo: "Rescuer leaves baby on platform", Text: Rescuer Leaves the Terrified Baby on the platform and returns to the wreckage to help other victims of the raid. Then a child and man approach (above) to take the baby to a near- by first aid station. At the right lies the body of a 14-year-old boy, one of the 15 children found dead in the raid. In bombing Shanghai, Japan struck at China's largest, wealthiest city. Planes also have bombed Nanking, China's capital"; Photo: "A child lies on a stretcher as adult hands tend to his wounds", Text: "Lying on a Stretcher on a sidewalk, the baby receives first aid from a Chinese boy scout… Three weeks later, on the occasion of the Japanese bombing of Nanking, the governments of the U.S., Britain and France sent a note of protest to the Japanese government against the bombing of civilian populations. But aerial raids continue, with an increasing toll of dead. Chinese bombers and gunners, as well as Japanese, have been responsible for some of the deaths of innocent non-combatants—American and European as well as Oriental—in this undeclared war" (International News photographs).

36. Fielding R. The American Newsreel, 1911–1967. Norman, OK, USA: University of Oklahoma; 1972.

37. Jespersen CT. American Images of China 1931–49. Stanford, CA, USA: Stanford University Press; 1996.

38. Time's circulation was 1,000,000. The photo's effect was so powerful that when Madame Chiang Kai-Shek arrived in the United States five years later, a New Jersey homemaker sent her a letter with three dollars to "help the little guy on the railroad tracks somewhere in China". Hariman and Lucaites, in No Caption Needed [39], identified the four traits or cultural conventions of an iconic photograph: wide recognition, a historically significant event, evoking a strong emotional response, and widespread reproduction (p. 85).

39. Hariman R, Lucaites JL. No Caption Needed. Chicago, IL, USA: University of Chicago Press; 2007.

40. Historian David Perlmutter supports the Hariman and Lucaites thesis ([39], pp. 3–8) that iconic images dominate public opinion, with a caveat noting the importance of individual predispositions and values. See Perlmutter ([41], pp. 2–19). See also W.J. Thomas Mitchell [42].

41. Perlmutter D. Photojournalism and Foreign Policy: Icons of Outrage in International Crises. Westport, CN, USA: Praeger; 1998.

42. Mitchell WJT. Picture Theory: Essays on Verbal and Visual Representation. Chicago, IL, USA: University of Chicago Press; 1994.

43. The graphic description adds to the disgust this image provokes. Interestingly, this appears to be one of the first times the word "holocaust" was used to describe the brutality that ranks among the most heinous that modern state machinery can provoke. The Nazi destruction of the Jews of Europe widened its definition from 1945 on to mean the Jewish genocide.

44. Roeder mentions that America suppressed similar wartime images, such as a 1945 photo of a Japanese soldier's severed head ([6], p. 148).

45. LIFE. 10 January 1938.

46. LIFE. 18 April 1938.

47. George Fitch, who had been in Nanking, smuggled the Magee film out of China and circulated it to many civic groups in the prewar period in an effort to convince Washington to cease selling scrap metal to Japan. Poor health prevented him from showing the film more frequently and he gave it to Arthur N. Bierkle who screened it to groups mainly in southern California. Wider dissemination occurred when *The March of Time* used some of the footage in 1942 and Frank Capra used segments in his wartime series *Why We Fight: The Battle for China,* 1944.

48. Nanjing Massacre (Sharon Kuykendall 17 April 1996). Available from: http://humanum.arts.cuhk.edu.hk/NanjingMassacre/NMMage.html (accessed on 18 November 2013).

49. LIFE. 30 May and 20 June 1938.

50. See LIFE issues 1, 15 August 1938; 17 October 1938; 7, 14, 21 November 1938; 5, 12 December 1938.

51. LOOK. 22 November 1938.

52. This photo was cropped and published again on 20 December 1938.

53. The photo and article are reproduced in [54]. The best known written accounts were by Harold J. Timperley [55] and Lewis Smythe [56].

54. Young S, Yin J. The Rape of Nanking: An Undeniable History in Photographs. Chicago, IL, USA: Innovative Publishing Group; 1997.

55. Timperley HJ. The Japanese Terror in China. New York, NY, USA: Modern Age Books; 1938.

56. Smythe L. War Damage in the Nanking Area, December 1937 to March 1938. Shanghai, China: Mercury Press; 1938.

57. In spite of the continuing coverage of the China warfront, Henry Luce's *LIFE* spent the majority of its efforts on events in Europe through 1938. There was no further reference to the Nanking atrocity.

58. Further bibliographic and philosophical speculation about atrocity photographs may be found in the earlier mentioned Sontag article in *The New Yorker*. See also [59] as well as Linfield's The Cruel Radiance [7]. Linfield believes that photojournalism has come to play a role in the establishment of human rights legislation. Two other approaches to this subject are [60] and ([61], pp. 117, 155–156).

59. Taylor J. Body Horror. Photojournalism, Catastrophe and War. Manchester, UK: Manchester University Press; 1998.

60. Messaris P. Visual Literacy: Image Mind and Reality. Boulder, CO, USA: Westview Press; 1994.

61. Newton JH. The Burden of Visual Truth: The Role of Photojournalism in Mediating Reality. Mahwah, NJ, USA: Erlbaum; 2001.

62. Joshua A. Fogel [10] follows the transformation of this event into an icon. The chapter titles are: Nanjing Massacre in History; Aggression Victimization and Chinese Historiography of the Nanjing Massacre; Battle over History: Nanjing Massacre in Japan; Challenges of the Nanjing Massacre: Reflections on Historical Inquiry.

63. Mark Eykholt [64] states that the brutality and primitive behaviour ran against Western society's conviction that the Japanese were civilized, hence would not commit such crimes.

64. Eykholt M. Aggression, Victimization, and Chinese Historiography of the Nanjing Massacre. In: Fogel JA, editor. The Nanjing Massacre in History and Historiography. Berkeley, CA, USA: University of California Press; 2000.

65. In the past decade, see accounts of the Asian perspective on the war in Christopher Bayly and Tim Harper [66,67]. See too Mitter [68] as well as Hotta [69].

66. Bayly C, Harper T. Forgotten Armies. London, UK: Penguin; 2005.

67. Bayly C, Harper T. Forgotten Wars. Belknap Press of Harvard University Press; 2007.

68. Mitter R. Forgotten Ally: China's World War II, 1937–1945. New York, NY, USA: Houghton Mifflin Harcourt; 2013.

69. Hotta E. Japan 1941: Countdown to Infamy. New York, NY, USA: Knopf; 2013.

70. Deluca [71] argues that in iconic images, iconic becomes transcendent and that images transform rhetoric, politics and history, citing Walter Benjamin, who said we are immersed in a torrent of imagery that constitutes public discourse. (79–89) There should be more methodological investigation of how the widely circulated newsreel images of the Japanese attack on Pearl Harbor (especially footage of the exploding battleship *Arizona*) became iconic in convincing the American public to wage the Pacific war as a war of revenge.

71. Deluca KM. The Speed of Immanent Images: The Dangers of Reading Photographs. In: Hope DS, editor. Visual Communication: Perception, Rhetoric and Technology. Cresskill, NJ, USA: Hampton Press; 2006.

72. Maclean's. 15 February and 15 March 1938.

73. *New York Times* reporters filed reports on the

fall of Nanking. These were edited by the *Gazette* on 8, 10, and 11 December with one article on the 22nd devoting one line to a 'breakdown of discipline'. 25 January marked the first reference to the 'scandalous' conditions of 'lawlessness and bestiality'. A day later an editorial repeated the main points and explained that Japan had forbidden foreign reporters to cable responsible editorial comments. On 8 February an article stated that General Matsui admitted that the army had run amok in Nanking, 'raping Chinese women, shooting private citizens and looting property'. These were the sole references to the Nanking atrocities.

74. Fielding R. The March of Time, 1935–1951. New York, NY, USA: Oxford University Press; 1978.

75. Luce interfered rarely in the series produced by Louis de Rochemont, if only to make Chiang Kai Shek a sacred cow. The construction of the newsreel was left to de Rochemont who made decisions on what to run.

76. The series' Pacific war issues were *Crisis in the Pacific, China Fights Back, The Philippines* and *Australia at War.*

77. The discussion of the total death toll includes the 1948 estimate of 200,000 to a more recent statistic of 369,366, which includes 190,000 victims of mass killings and 150,000 victims of random killings including rape (pp. 242–244). Japanese officer Toshio Ohta discussed body disposal at Xiaguan where 30,000 soldiers and 120,000 civilians including elders, women and children were disposed of (p. 260). Revisionist scholarship of the 1990s challenged this so-called traditionalist interpretation. Revisionists have cut by more than half the 300,000 plus figure, though the figure of at least 20,000 or more rapes seems not to be an issue for them.

78. Fitch's film evidence appeared in the 1990s in two documentaries, *Testament* by Magee and *In the Name of the Emperor* by Choy and Tong.

79. Capra F, director. Why We Fight. No. 6 "The Battle of China". Maydace Video; 1944.

80. Culbert D.'Why We Fight': Social Engineering for a Democratic Society at War. In: Short KRM, editor. Film and Radio Propaganda in World War II. Knoxville, TN, USA: University of Tennesee Press; 1983.

81. 557 Canadians perished in battle or in Japanese prison camps.

82. Morton D. Canada and War. Toronto, Canada: Butterworths; 1981.

83. In 1942 the Red Cross reported that the Canadian commanding officer stated the prisoners were well treated and they could not complain about the food.

84. Roy PE, Granatstein JL, Iino M, Takamura H. The Hong Kong Disaster. In: Granatstein JL, Neary P. The Good Fight: Canadians and World War II. Toronto, Canada: Copp Clark; 1995.

85. Grierson J. Grierson on Documentary. London, UK: Collins, 1946.

86. The photo section shows the newspaper with the lieutenants posing.

87. Wakabayashi [13] features a chapter in part defending the perpetrators (pp. 115–148).

88. Aitken I. The Documentary Film Movement: An Anthology. Edinburgh, UK: Edinburgh University Press; 1988.

89. Evans G. John Grierson: Trailblazer of Documentary Film. Montreal, Canada: XYZ Publishing; 2005.

90. In Body Horror [59], Taylor refers to Devereaux and Hillman [91] as well as to John Keane [92].

91. Devereaux L, Hillman R, editors. Fields of Vision, Essays in Film Studies, Visual Anthropology and Photography. Berkeley, CA, USA: University of California Press; 1995.

92. Keane J. Reflections on Violence. London, UK: Verso; 1996.

93. There have been tentative steps to rectify this as some hundreds of interviews with or diaries of former Japanese soldiers have been recorded in the past 15 years. These should strengthen the case for Japan accepting its moral responsibility for the atrocity in order to bring closure. Takahashi Yoshida [94] documents how many Japanese veterans' recorded experiences attest to the extent and destructiveness of the army's rampage. Many such confessions appear in the docudrama Iris Chang: The Rape of Nanking [21].

94. Yoshida T. A Battle over History in Japan. In: Fogel JA, editor. The Nanjing Massacre in History and Historiography. Berkeley, CA, USA: University of California Press; 2000.

95. A recent article by Yinan He [96] asserted that China's political elite may not control the national mythmaking process and that dissenting views held by the public at large were often motivated by patriotism. He does not consider the role of collective memory as activated by such imagery as we have discussed here.

96. He Y. Remembering and Forgetting the War: Elite Mythmaking, Mass Reaction and Sino-Japanese Relations 1950–2006. History and Memory. 2007;19 (2):43–74.

97. Bonisteel R, director. From the Ashes: Conversation with Elie Wiesel. CBC Television; 1973.

98. Hardt H, Brennan B. Picturing the Past. Champaign, IL, USA: University of Illinois Press; 1999.

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