Measuring Bias in News Websites, Towards a Model for Personalization

Brendan Spillane
ADAPT Centre,
Trinity College Dublin,
Ireland
brendan.spillane@adaptcentre.ie

Séamus Lawless
ADAPT Centre,
Trinity College Dublin,
Ireland
seamus.lawless@adaptcentre.ie

Vincent Wade
ADAPT Centre,
Trinity College Dublin,
Ireland
vincent.wade@adaptcentre.ie

ABSTRACT

This poster briefly elucidates on a crowdsourced exploratory study demonstrating the impact of common features of news websites' design on perceived bias. Type of news website, user characteristics, and the overall design, were shown to impact on perceived bias. The poster also reports the results of a novel method to validate and extend the initial results through comparative reevaluation. These confirmed the initial results and revealed additional significant findings. Lastly, the paper proposes a model of bias for personalizing news websites.

CCS CONCEPTS

• **Human-centered computing~User models** • Human-centered computing~User studies • *Information systems~Personalization*

KEYWORDS

Bias, Personalization, User Modeling, News Website Design

1 INTRODUCTION

Research into news bias, which has embraced each new medium as they become standard channels of dissemination, has tended to focus on the identification of perceived bias within the source, the study and comparison of bias in different mediums, and the impact of bias on the consumer. Research has also investigated specific issues e.g. journalistic, editorial and image bias. Recently, research has focused on online news, specifically content bias. Presentation bias, which has been looked at in traditional mediums [3], is now being investigated online [1]. In related work, website aesthetics have been shown to impact perceived credibility, of which bias is a core dimension and one of its most common measures [4]. However, currently there is a lacuna as to how the presentation of news online (the fastest growing medium of dissemination) may be impacting perceived bias.

UMAP '17, July 09-12, 2017, Bratislava, Slovakia

ACM ISBN 978-1-4503-4635-1/17/07.
http://dx.doi.org/10.1145/3079628.3079647

2 THE IMPACT OF FEATURES OF A WEBSITE'S DESIGN ON PERCIEVED BIAS

Technical or structural features of a website's design are the building blocks with which a news webpage is constructed. The actual text or content of the news article may be considered as just one feature of a news webpage. Features may combine text, images, links and other interactive elements and are used to convey a message and/or provide a service, e.g. search facilities, advertising, social media buttons, etc. These features, and other aspects of a website's design, are likely imparting additional information to the central message of the news article.

In order to test this, an exploratory study, using a new WDM Credibility Assessment Framework, in which 135 participants were required to rate perceived positive or negative bias in the design of 9 news webpages was conducted. Each webpage went through a series of 8 distortions (D1 - D8), where each distortion removed one feature of the page. Including the control (D0), an original undistorted version of each webpage, a 9x9 within-subject incomplete counterbalanced measures design was achieved.

Incomplete counterbalancing was attained by arranging the 9 webpages and 9 distortions, D0 - D8, on the axis of a reduced form Latin square and by assigning participants, at random, to one of 9 diagonal paths through the Latin square, thus ensuring they experienced each webpage and distortion once. Once assigned to a path, the webpage/distortion combinations were randomized to reduce carryover and fatigue. After rating three such webpages independently, each user was presented with all three so that they could comparatively reevaluate them.

3 COMPARATIVE REEVALUATION

News organizations attempt to portray themselves in a certain light which represents the views and culture of the organization and their consumers. This is transferred to the consumer not only through the content of the news article, but the news that they cover, the language, tone, use of images and their adherence to good journalism, editorial and gatekeeping practices. The style and design philosophies behind their websites are the medium by which this is conveyed to the consumer online. The most obvious manifestation of this is the recognizable difference between tabloid news websites and their more serious counterparts. The design of the website conveys additional messages and influences to that intended to those conveyed in the textual content of a news article. Of a total of 930 individual data observations, users amended their ratings 62

times, 34 times to increase the perceived bias and 28 to decrease it. In just 3 instances participants flipped their perception of bias from positive to negative or vice versa.

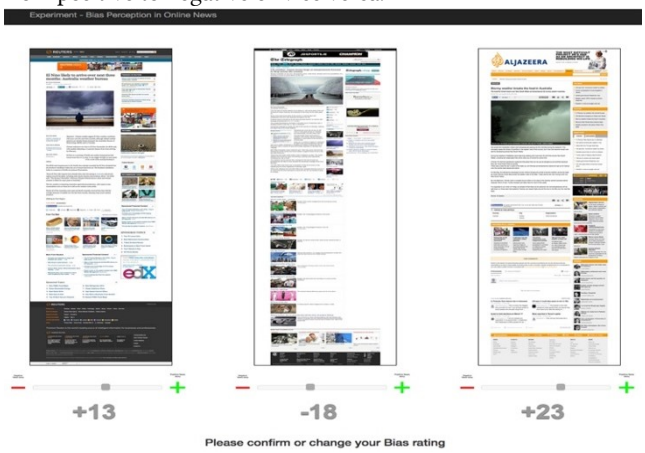

Figure 1 Comparative Reevaluation Interface

4 RESULTS

Significant differences were found between some of the controls and two of their respective distortions when the initial independently rated results were examined. Firstly, Distortion 5, the removal of promoted internal content and services such as paid for content, on The Spectator's website. Secondly, Distortion 7, the removal of article interaction buttons such as social media buttons, on The Economist and Reuter's websites.

When the reevaluated results were examined, the initial results were confirmed and additional significant differences found. Distortion 5 was also shown to have an impact on the Telegraph and Distortion 7 was also shown to impact The Spectator. The type of website and design were shown to impact perceived bias. Out of the 9 websites tested, 39.3% of participants selected The New Statesman as the most positively biased and 31.8% selected The Spectator as the most negative. These results correlate closely with their individual distorted ratings. The websites of traditional print media were shown to be the least biased while those of news magazines were the most polarizing. Certain categories of user characteristics were shown to impact perceived bias, though the results will need further study. Younger participants leaned towards a perceived positive bias while those on a high income tended towards a negative bias.

5 A BIAS MODEL FOR PERSONALSIATION

This research opens a path to developing a model of bias. News websites are increasingly adapting to individual users [5]. Bias is also a core concern (30.2%) of those judging the credibility of news websites [2]. As such, adapting a news website's interface to decrease perceived bias, thus increasing perceived credibility, is in the best interests of online news providers.

The nature of the domain or content is the adaptive display of news webpages. The structure of the model will be a weighted overlay model using a Bayesian network instead of the traditional, simpler scalar model. The technical approach proposed to store the impact of features and aspects of the design on perceived bias, is a domain bias model overlaid on an individual bias model. Gathering the requisite user data will be explored via a new, explicit, social bias interaction button, enabling participants to report perceived bias in a news article to their preferred social media platforms, while at the same time allowing publishers to gather consumers' feelings as to the amount and direction of the perceived bias. Users already regularly comment and share news articles that they consider biased or which they agree with, often a strong indicator of personal bias, thus this facility will simplify the process. In future, research will be undertaken to mine via machine learning, what features and aspects of news website design impact perceived bias among different groups of users. Considerations, such as the topic, will also be taken into account.

6 CONCLUSIONS

Our findings demonstrate that the inclusion or exclusion of certain features of a news website's design can impact on the perception of positive or negative bias. The underlying design of different types of news websites, traditional print, news magazine, and international news agencies, were also shown to affect perceived bias. The paper demonstrates a novel comparative reevaluation stage to this crowdsourced bias experiment which validated the initial results and revealed additional significant findings. Lastly the paper proposes a weighted overlay model using a Bayesian network to personalize the experience of individual users.

ACKNOWLEDGMENTS

The ADAPT Centre for Digital Content Technology is funded under the SFI Research Centres Programme (Grant 13/RC/2106) and is co-funded under the European Regional Development Fund.

REFERENCES

1. Judit Bar-Ilan, Kevin Keenoy, Mark Levene, and Eti Yaari. 2009. Presentation bias is significant in determining user preference for search results—A user study. *Journal of the American Society for Information Science and Technology* 60, 1: 135–149. https://doi.org/10.1002/asi.20941

2. B. J. Fogg, Jonathan Marshall, Othman Laraki, Alex Osipovich, Chris Varma, Nicholas Fang, Jyoti Paul, Akshay Rangnekar, John Shon, Preeti Swani, and Marissa Treinen. 2001. What makes Web sites credible?: a report on a large quantitative study. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (CHI '01), 61–68. https://doi.org/10.1145/365024.365037

3. Tim Groeling. 2013. Media Bias by the Numbers: Challenges and Opportunities in the Empirical Study of Partisan News. *Annual Review of Political Science* 16, 1: 129–151. https://doi.org/10.1146/annurev-polisci-040811-115123

4. David Robins and Jason Holmes. 2008. Aesthetics and credibility in web site design. *Information Processing & Management* 44, 1: 386–399. https://doi.org/10.1016/j.ipm.2007.02.003

5. Neil Thurman and Steve Schifferes. 2012. The Future of Personalization at News Websites. *Journalism Studies* 13, 5–6: 775–790. https://doi.org/10.1080/1461670X.2012.664341