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Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA, MERCED

Effects of Interventions on Bias Detection

A Thesis submitted in partial satisfaction of the requirements  
for the degree of Master of Science

in

Cognitive and Information Sciences

by

Ayonna Arshay Jones

Committee in charge:

Professor Tyler Marghetis, Co-Chair  
Professor Zenaida Aguirre- Muñoz, Co-Chair  
Professor Lace Padilla

2023

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The Thesis of Ayonna Arshay Jones is approved, and it is acceptable  
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2023

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## **Abstract**

### Effects of Interventions on Bias Detection

By Ayonna Jones for the partial satisfaction of the requirements  
for the degree of Master of Science in Cognitive and Information Sciences, University of  
California, Merced, 2023

Professor Tyler Marghetis and Professor Zenaida Aguirre-Munoz

Without the ability to detect biased news, misinformation can spread easily. Are people able to detect biased headlines, and can this ability be improved? Do our own biases impair our ability to accurately detect biased headlines? To find out, an online experiment study was conducted wherein participants were randomly assigned to receive either anti-bias training or media history training. After completing the brief training, participants rated the bias of news headlines. Results indicated that participants were able to detect biased headlines, and this ability was significantly improved by the brief anti-bias training. Moreover, participants' ability to detect biased headlines was modulated by their political affiliation and trust in the news. In conclusion, while biased news reporting can be a source of misinformation and can potentially mislead the public, we find that naive participants are reliably able to detect biased headlines and that this ability can be easily and quickly improved.



## Introduction

People can create their belief systems and morals, but can they do so without the world around them telling them what to think? Can people avoid the effects of biased media on their beliefs, decisions, and perceptions of the world around them? Do people have the ability to acknowledge the bias they encounter in their everyday lives? Today's society contains a plethora of overt or covert influences from media such as television, music, and social media. This abundance of influences makes it difficult to detect biased language or behaviors in the forms of media that we see today. Without the ability to detect skewed news, it can be easy to spread misinformation. Although it can be easy to find content that aligns with one's ideologies and morals, it can be just as easy to consume and believe in false or one-sided messages. This is why people must have strong media literacy.

The widely accepted definition of media literacy is "the ability to access, analyze, evaluate, and create messages in a wide variety of forms" (Aufderheide, 1993). However, this paper will use the definition given by Renee Hobbs which states that media literacy is the "ever-changing set of knowledge, skills, and habits of mind required for full participation in a contemporary media-saturated society" (Hobbs, 2021). We prefer this more recent definition because it better captures the influence of the transformation of knowledge and the need to obtain skills needed to navigate today's media landscape. Utilizing media literacy and having strong bias detection can help prevent susceptibility to inaccurate news. Additionally, people will be able to create beliefs that are more accurate to their true beliefs, rather than extreme viewpoints that the media might try to instill in them. In this study, we examine the role of anti-bias media literacy training on one's ability to detect biased news headlines.

In this study, I explored four questions: (1) Can people detect biased headlines (2) Can a brief training improve people's discrimination of biased headlines? (3) Are there partisan differences in people's sensitivity to biased headlines and responsiveness to the training? (4) Does one's trust in the news affect their ability to discriminate between biased and unbiased headlines? Question number one and two are the driving questions for this study.

It has been shown that media literacy education can have profound effects on participants' beliefs and viewpoints on softer topics such as alcohol and drugs (Hindmarsh et al. 2015; Austin et al., 2016; Pinkleton et al., 2007). Education efforts may be more difficult on more controversial topics or subjects where individuals have strong opinions such as crime or social movements. Despite the varying influences on interventions, there is no doubt that they can sometimes be effective (Jeong et al., 2012). It is important to note that when people are presented with knowledge that opposes their

strong beliefs or identity, an intervention can be less effective or not effective at all. Examples of individual differences that can create this barrier to learning are political affiliation, age, or gender (Aboud et al. 2012). For people to gain the most knowledge from an intervention they must be engaged and invested in the training. That is why it is important when creating interventions to know the target audience and present knowledge in a method that would be the most persuasive. The more effective an intervention is, the stronger one's media literacy and bias perception can become.

Headlines are supposed to be the window into the content of a news article. It is normal for people to take information from news headlines and perceive them as true based on their trust. Whether or not that trust is rooted in credibility or similar ideologies, we are unsure. When skimming through daily news, it is common only to read the headlines and not the actual news story. Given the common practice of just reading news headlines, it is important to know whether we can improve people's ability to detect biased headlines.

In this study, we tested the efficacy of a brief intervention that was designed to train people to detect biased headlines. Participants were randomly assigned to either read a brief anti-bias training or training on the history of news media. After reading their assigned training, participants were told to rate the perceived bias levels of news article headlines.

Several potential outcomes are foreseeable. The first potential outcome predicted is that participants will be able to detect biased headlines accurately. Second, participants who received the brief anti-bias training will be able to improve their media literacy and more accurately rate the bias levels of the news headlines. However, for both predictions, they would be highly influenced by the partisan stances of the participants. Democratic participants would possibly have more trouble accurately rating the bias of far-left headlines. The same could be said for Republican participants. The third potential outcome relates to trust. Those with low trust in the news would have higher bias ratings for all news articles compared to those with higher trust in the news.

## Methods

### *Participants*

Undergraduate students from the University of California, Merced (N = 88) participated in this study. The study consisted of an online survey constructed through Qualtrics and administered via Sona Systems, a participant recruiting system open to the university population. Participants who completed the online survey were compensated with subject pool credit through Sona Systems in the amount of 0.5 credits (typically used as extra credit for courses). One participant was excluded from the analysis due to a failure to complete the survey. The sample consisted of 15 men and 70 women. Two participants identified as non-binary and one preferred not to answer the gender question. The age of participants ranged from 17 to 41 years of age ( $m = 20$ ). In terms of partisanship 62.5% of participants identified as Democrat, 6.8% as Republican, 12.5% as Independent, and 18.2% as none.

### *Design*

A 2 (training) x 3 (headline bias) mixed design was implemented to test the impact of anti-bias training on bias detection in news headlines. Participants were randomly assigned to one of two training groups: one group received anti-bias training and the control group received media history training (Table 1). Participants in the anti-bias training treatment condition read a short, five-page text on bias in news media. The control group read text on media history similar in length to the anti-bias training text. In the control condition, participants learned about where media started and where it is currently (printed text, television, social media, etc.). Headlines reflected three levels of bias: far right (biased), center (unbiased), and far left (biased). Headline bias was manipulated within subjects.

### *Headlines*

Actual news headlines (N = 24) were taken from twelve different news sources. The news sources were divided evenly into three bias levels - far right (The Federalist, The American Spectator, National Review, Breitbart News), center (Forbes, Wall Street Journal news, BBC news, Reuters), and far left (CNN, New York Times, Vox, MSNBC). Ratings are based on various methods including a multi-partisan analysis panel and a blind bias survey administered to typical Americans across the political spectrum by AllSides (2022) (e.g., editorial review, blind bias survey, community feedback) to determine the biased leanings of each news source. The chosen news sources were

amongst some of the most highly agreed upon in terms of their ratings. This was done to make sure that along with the scientific analysis, the ratings reflected community perceptions of bias. One abortion-themed headline and one immigration-themed headline were used from each news source, so each theme consisted of 12 headlines. Headlines were chosen based on the strong uses of biasing tactics such as word choice and spin.

*Trainings*

Two five-page written pieces of training, approximately 530 words in length, were presented to the participants before receiving the stimuli. The first training, used for the treatment group, is anti-bias training. The training was designed to teach participants to know what bias is and how to detect it within news headlines using word choice and spin. The second training served as the control training; it focused on the history of the media. In the media history training, participants learned about where media started and where it is currently (printed text, television, social media, etc.). To reduce the probability of any possible confounds, the two training texts were identical in word count and formatting.

**Table 1**

Comparison of Control (Media History) and Treatment (Anti-Bias) Training Materials

Training Comparison	
Media History Training	Anti-Bias Training
<p><i>First is television, specifically credible news stations such as Fox and MSNBC. Television news stations when they first started out would only air 10 to 15-minute newscasts, and now can be anywhere between 6 to 24-hour news broadcasts (depending on the station).</i></p> <p><i>No matter what time of day there is always a source of information at one's disposal. News television can take place on different scales, such as local news or national news.</i></p>	<p><i>What is bias? Bias is the tendency to prefer one thing over another in a way that is not objective. Bias can be noticeable (overt) or more subtle (covert). Bias is widespread in everyday conversation, on social media, and even in reputable news sources.</i></p> <p><i>Let's focus on the news media. There are various tactics used to incorporate bias in the news, but we will be discussing two: word choice and spin.</i></p>

*Note:* Excerpts are taken from the second page of each training.

### *Procedure*

Participants first gave informed consent. Participants then answered eight questions about the news, four to six relating to online sharing, and two about news trust. Two of the online sharing questions asked about fact-checking behavior and their process for doing so. However, one or both of those process questions were only displayed if participants did not choose “not at all” as their answer to the “How likely are you to ‘fact check’?” questions. Participants then read either the anti-bias training text or the history of media training text, depending on their assigned group.

Once the participant finished reading the training, they were then told to judge the bias of the news headlines (N = 24; Table 2). They are told they will be shown a series of headlines from various news sources, and to rate the level of bias reflected in each headline. Once given the instructions, participants are presented, in random order, the 24 news article headlines. Along with each headline, the following prompt is displayed: “Please rate the bias level of the following headline.” They are given a Likert scale ranging from one (not biased) to seven (biased). Four is labeled as moderately biased.

Finally, participants completed a standard survey of demographic information (age, gender, race), discussion of news, and political affiliation. The news discussion questions are about time spent on various social media platforms and the amount of time discussing news. Once participants finish the survey, a thank you prompt is displayed, telling the participants to click the next arrow to be redirected to SONA to receive their SONA credits.

**Table 2**

Sample Headlines from each bias level.

Far Left (Biased)	Center (unbiased)	Far Right (Biased)
“We need to call abortion bans what they are: Slavery  Banning the procedure is literally forced labor. Recognizing this in a post-Roe world is essential.”	“Kansas has voted to protect abortion rights”	“Abortion Supporters Wish Rape on Pro-Lifers, Cut Out Beating Hearts, Practice On Papayas”

*Note:* These headlines received the highest bias ratings for their bias levels.

## Results

### *Bias Detection*

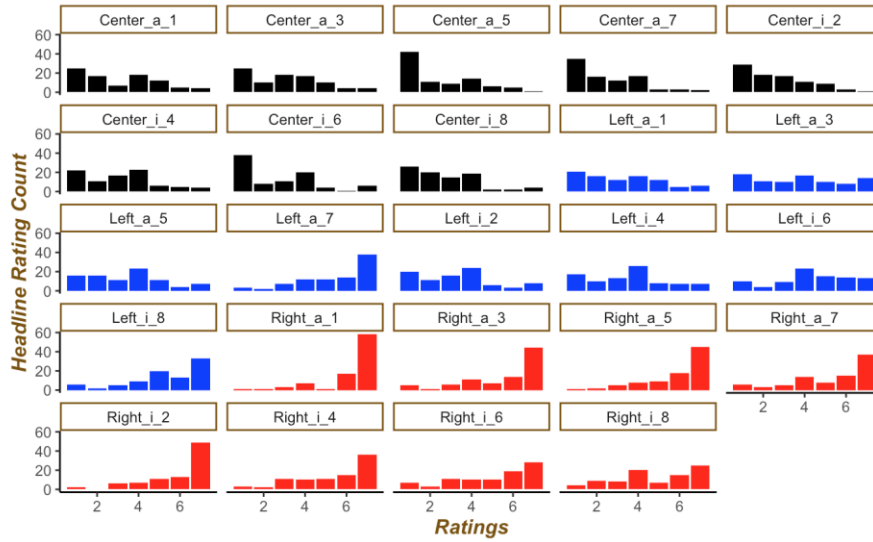
To test whether participants can detect biased headlines, a mixed effects regression model was used (Model 1). Numeric ratings for each headline were used as the dependent variable, while headline political leanings conditions were the predictor. Random effects with varying intercepts for each subject were also included<sup>1</sup>. Unbiased “center” headlines were rated as low in bias ( $M = 2.77$ ), while the far left ( $M = 5.56$ ) and far right ( $M = 4.07$ ) headlines were rated as significantly more biased. Moreover, the right-leaning headlines were rated as numerically more biased than the left-leaning headlines (Table 3).

**Table 3**  
Model 1 Results

<i>Predictors</i>	<b>Rating</b>				
	<i>Estimates</i>	<i>std. Error</i>	<i>CI</i>	<i>p</i>	<i>df</i>
(Intercept)	2.77	0.09	2.59 – 2.95	<b>&lt;0.001</b>	2107.00
PoliticalLeaning2 [Right]	2.79	0.09	2.61 – 2.97	<b>&lt;0.001</b>	2107.00
PoliticalLeaning2 [Left]	1.30	0.09	1.12 – 1.48	<b>&lt;0.001</b>	2107.00
<b>Random Effects</b>					
$\sigma^2$	2.98				
$\tau_{00 \text{ id}}$	0.38				
ICC	0.11				
$N_{\text{id}}$	88				
Observations	2112				
Marginal $R^2$ / Conditional $R^2$	0.279 / 0.361				

*Note:* A mixed-effects regression model with numeric ratings for each headline as the dependent variable and headline political leanings as the predictor. Random effects with varying intercepts were included (`lmer(Rating ~ 1 + PoliticalLeaning2 + (1|id), data = d_longer)`).

<sup>1</sup> `lmer(Rating ~ 1 + PoliticalLeaning2 + (1 | id), data = d_longer)`

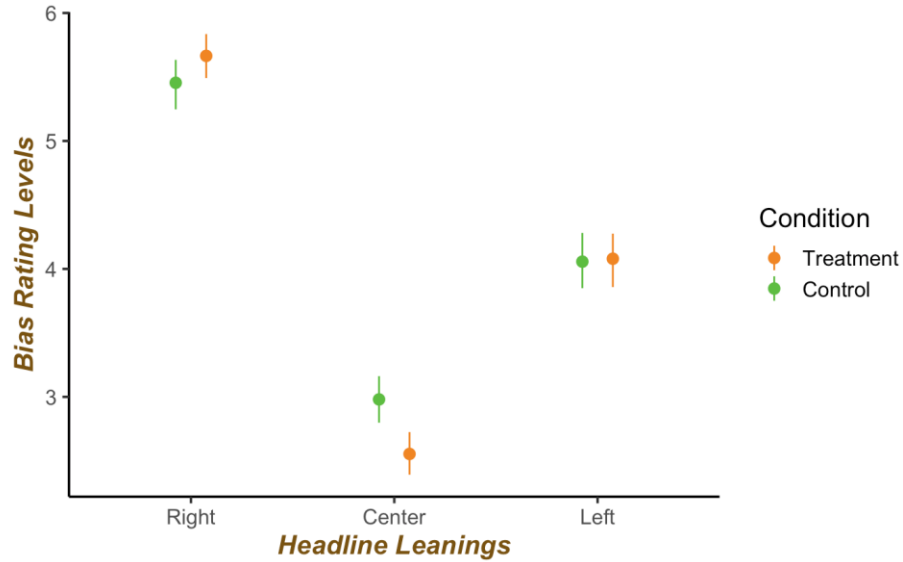


**Figure 1. Rating Count by Article Headline.** Each panel represents a news headline. The colors represent the political leaning of the headline - red (right-leaning), blue (left-leaning), and black (center). The titles for each plot indicate the leaning, topic (“a” for abortion and “i” for immigration), and a number given to each headline as a marker.

#### *Anti-Bias Training Effectiveness*

A mixed effects regression model was used to examine the effectiveness of the anti-bias training (Model 2). Numeric ratings for each headline were used as the dependent variable, while headline political leanings conditions were the predictor. Random effects with varying intercepts for each subject were also included, as well as an interaction between participant conditions and headline conditions<sup>2</sup>. Participants in the treatment condition were better at discriminating biased from unbiased headlines (Figure 2). Participants in the control condition when determining the bias levels of right-leaning ( $M = 5.45$ ) and left-leaning headlines ( $M = 4.06$ ) rated them significantly lower than they would have if given the treatment. Participants in the treatment condition rated the far-right-leaning headlines ( $M = 5.66$ ) as more biased than those in the control condition. Ratings for the center-leaning headlines were lower amongst those in the treatment condition ( $M = 2.55$ ) and higher in the control ( $M = 2.98$ ). However, the far-left headlines were rated the same by the treatment ( $M = 4.08$ ) and control groups.

<sup>2</sup> `lmer(Rating ~ 1 + PoliticalLeaning2*Condition + (1 | id), data = d_longer)`



**Figure 2: Treatment and Control Group Mean Bias Ratings.** The treatment group is the anti-bias training, while the control group is the media history training. The average ratings are compared between headline bias conditions (right, center, or left).

**Table 4**

Results from Model 2

<i>Predictors</i>	<i>Estimates std. Error</i>		<b>Rating</b>		
			<i>CI</i>	<i>p</i>	<i>df</i>
(Intercept)	2.55	0.13	2.30 – 2.81	<b>&lt;0.001</b>	2104.00
PoliticalLeaning2 [Right]	3.11	0.13	2.86 – 3.37	<b>&lt;0.001</b>	2104.00
PoliticalLeaning2 [Left]	1.53	0.13	1.27 – 1.78	<b>&lt;0.001</b>	2104.00
Condition [2]	0.43	0.19	0.06 – 0.79	<b>0.021</b>	2104.00
PoliticalLeaning2 [Right] * Condition [2]	-0.64	0.18	-1.00 – -0.28	<b>0.001</b>	2104.00
PoliticalLeaning2 [Left] * Condition [2]	-0.45	0.18	-0.81 – -0.09	<b>0.015</b>	2104.00
<b>Random Effects</b>					
$\sigma^2$	2.97				
$\tau_{00 \text{ id}}$	0.38				
ICC	0.11				
$N_{\text{id}}$	88				
Observations	2112				
Marginal $R^2$ / Conditional $R^2$	0.283 / 0.365				



*Note:* A mixed-effects regression model with numeric ratings for each headline as the dependent variable and headline political leanings as the predictor. An interaction between headline conditions and participant conditions (treatment and control groups), as well as random effects with varying intercepts, were included ( $\text{lmer}(\text{Rating} \sim 1 + \text{PoliticalLeaning2} * \text{Condition} + (1 | \text{id}), \text{data} = \text{d\_longer})$ ).

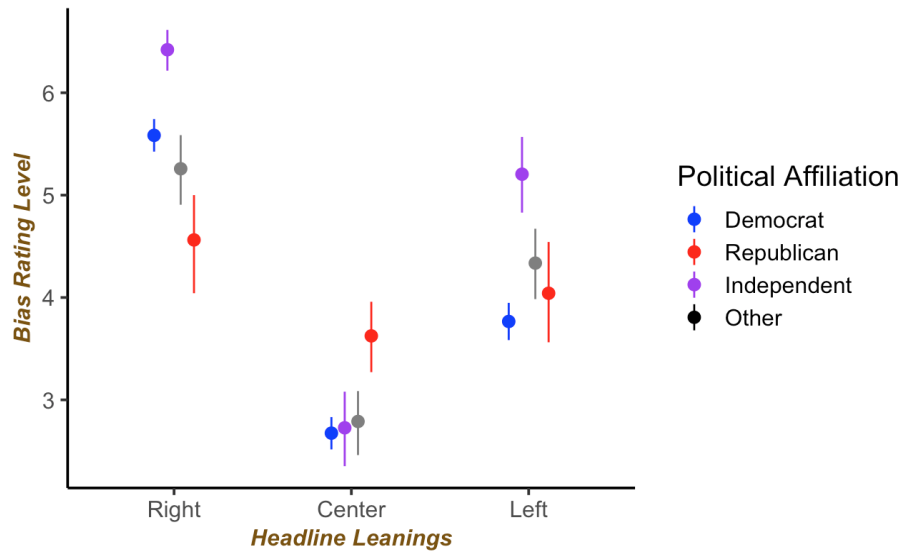
### *Effects of Partisanship*

To test the effects of participant partisanship, another mixed effects model (Model 3) was used. Numeric ratings for each headline were used as the dependent variable, while headline political leanings conditions were the predictor. Random effects with varying intercepts for each subject were also included, as well as an interaction between political affiliation and headline condition<sup>3</sup>. It was found that participants who identify as Republican rate right-leaning ( $M = 4.56$ ) and left-leaning headlines ( $M = 4.04$ ) significantly lower in bias as compared to those who identify as Democrat or Independent (Table 5). Overall, Republican participants rated headlines significantly lower than those who chose any other political affiliation, or none.

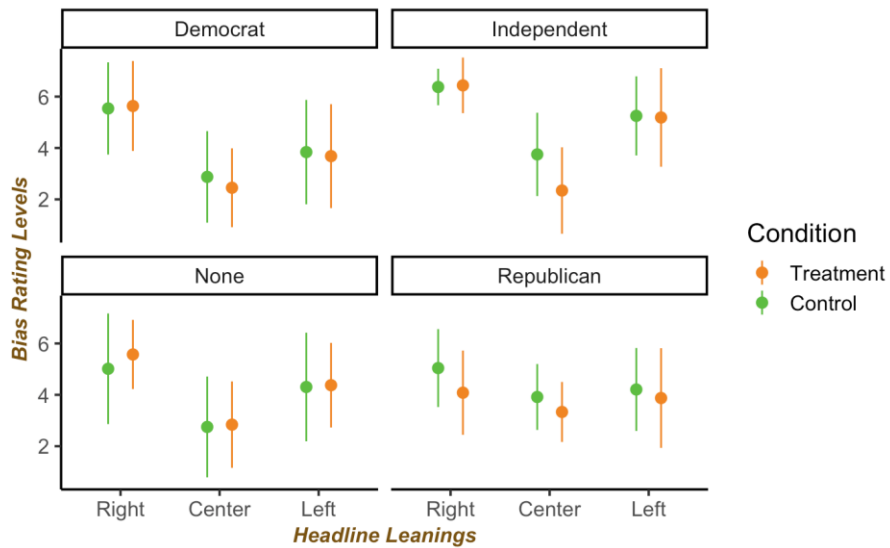
Based on the average ratings for each bias level based on participant political affiliation (Figure 4), participants who identify as independent are the best at accurately discriminating levels of bias across all three headline political leanings/bias levels compared to those who identified as a Democrat, Republican, or other. It was also observed that participants who identify as Democrats are better at accurately detecting bias levels amongst right ( $M = 5.58$ ) and center headlines ( $M = 2.68$ ) compared to Republican-identifying participants. However, when it comes to left-leaning headlines, participants from both parties rated the headlines similarly (Figure 3). Interestingly, Republican-identifying participants view right ( $M = 4.56$ ), center ( $M = 3.63$ ), and left-leaning headlines ( $M = 4.04$ ) to be moderately biased.

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<sup>3</sup>  $\text{lmer}(\text{Rating} \sim 1 + \text{PoliticalLeaning2} * \text{isRepublican} + (1 | \text{id}), \text{data} = \text{d\_longer})$



**Figure 3: Mean bias ratings differed by participant political affiliation.** The political affiliation options are “Democrat” (blue), “Republican” (red), “Independent” (purple), and “Other” (Black). The average ratings based on political parties are compared between headline bias conditions (right, center, or left).



**Figure 4: Average Bias Ratings between Treatment and Control Groups by Political Party Affiliation.** The panels represent participants' political party affiliation (democrat, independent, none, and Republican). The treatment group is the anti-bias training, while the control group is the media history training. The average ratings are compared between headline bias conditions (right, center, or left).

**Table 5**  
Model 3 Results

<i>Predictors</i>	<i>Estimates std. Error</i>		<b>Rating</b>		
			<i>CI</i>	<i>p</i>	<i>df</i>
(Intercept)	2.70	0.10	2.52 – 2.89	<b>&lt;0.001</b>	2104.00
PoliticalLeaning2 [Right]	2.93	0.09	2.74 – 3.11	<b>&lt;0.001</b>	2104.00
PoliticalLeaning2 [Left]	1.37	0.09	1.18 – 1.55	<b>&lt;0.001</b>	2104.00
isRepublicanTRUE	0.92	0.37	0.20 – 1.64	<b>0.012</b>	2104.00
PoliticalLeaning2 [Right] * isRepublicanTRUE	-1.99	0.36	-2.70 – -1.28	<b>&lt;0.001</b>	2104.00
PoliticalLeaning2 [Left] * isRepublicanTRUE	-0.95	0.36	-1.66 – -0.24	<b>0.009</b>	2104.00
<b>Random Effects</b>					
$\sigma^2$	2.94				
$\tau_{00 \text{ id}}$	0.39				
ICC	0.12				
$N_{\text{id}}$	88				
Observations	2112				
Marginal $R^2$ / Conditional $R^2$	0.288 / 0.370				

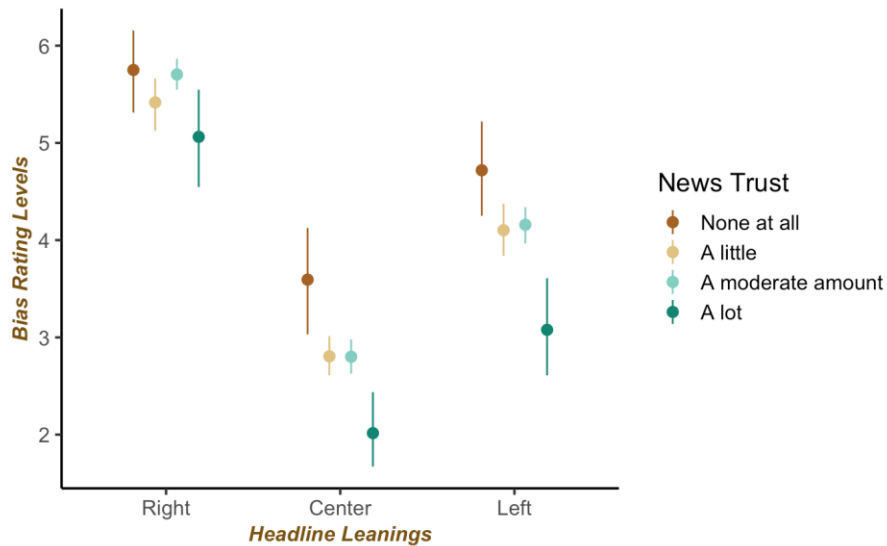
*Note:* A mixed-effects regression model with numeric ratings for each headline as the dependent variable and headline political leanings as the predictor. An interaction between headline condition and party affiliation, as well as random effects with varying intercepts, were included (`lmer(Rating ~ 1 + PoliticalLeaning2*isRepublican + (1 | id), data = d_longer)`)

### *News Trust*

To test the effects of participant trust in news, a new mixed effects model (Model 4) was used. Numeric ratings for each headline were used as the dependent variable, while headline political leanings conditions were the predictor. Random effects with varying intercepts for each subject were also included, as well as an interaction between news trust and headline condition (Table 6)<sup>4</sup>. The model shows that participants who had a lot of trusts in the news rated right-leaning ( $M = 5.06$ ), center ( $M = 2.01$ ), and left-leaning headlines ( $M = 3.08$ ) significantly lower compared to those with less trust.

<sup>4</sup> `lmer(Rating ~ 1 + PoliticalLeaning2*news_trust + (1 | id), data = d_longer)`

When observing average ratings across each bias level based on participant trust in the news (Figure 5), it can be seen that participants that have no trust in the news rate center (M = 3.6), right (M = 5.75), and left headlines (M = 4.72) as more biased than those who have a lot of trust in the news. However, those who do have a lot of trust in the news are better at discriminating against biased and unbiased headlines.



**Figure 5: Mean Bias Ratings across Headline Conditions based on Participant Trust in News.** A comparison of average bias ratings between participant trust in news. The news trust options are “None at all” (brown), “A little” (gold), “A moderate amount” (light green), and “A lot” (dark green). The average ratings based on news trust are compared between headline bias conditions (right, center, or left).

**Table 6**  
Model 3 Mixed Effects Regression Results

<i>Predictors</i>	<i>Estimates std. Error</i>		<b>Rating</b>		
			<i>CI</i>	<i>p</i>	<i>df</i>
(Intercept)	3.59	0.42	2.78 – 4.41	<b>&lt;0.001</b>	2098.00
PoliticalLeaning2 [Right]	2.16	0.43	1.31 – 3.00	<b>&lt;0.001</b>	2098.00
PoliticalLeaning2 [Left]	1.13	0.43	0.28 – 1.97	<b>0.009</b>	2098.00
news trust [A little]	-0.79	0.45	-1.66 – 0.09	0.078	2098.00
news trust [A moderate amount]	-0.79	0.43	-1.64 – 0.06	0.068	2098.00
news trust [A lot]	-1.58	0.51	-2.58 – -0.58	<b>0.002</b>	2098.00
PoliticalLeaning2 [Right] * news trust [A little]	0.45	0.46	-0.45 – 1.36	0.325	2098.00
PoliticalLeaning2 [Left] * news trust [A little]	0.17	0.46	-0.74 – 1.08	0.711	2098.00
PoliticalLeaning2 [Right] * news trust [A moderate amount]	0.75	0.45	-0.13 – 1.63	0.096	2098.00
PoliticalLeaning2 [Left] * news trust [A moderate amount]	0.23	0.45	-0.65 – 1.11	0.605	2098.00
PoliticalLeaning2 [Right] * news trust [A lot]	0.89	0.53	-0.15 – 1.93	0.092	2098.00
PoliticalLeaning2 [Left] * news trust [A lot]	-0.06	0.53	-1.10 – 0.97	0.906	2098.00
<b>Random Effects</b>					
$\sigma^2$	2.98				
$\tau_{00 \text{ id}}$	0.32				
ICC	0.10				
$N_{\text{id}}$	88				
Observations	2112				
Marginal $R^2$ / Conditional $R^2$	0.295 / 0.364				

*Note:* a mixed-effects regression model with numeric ratings for each headline as the dependent variable and headline political leanings as the predictor. An interaction between headline condition and party affiliation, as well as random effects with varying intercepts, were included `lmer(Rating ~ 1 + PoliticalLeaning2*news_trust + (1 | id), data = d_longer)`

## Discussion

The findings from this training study showed that people could detect biased headlines. When given a brief training, participants were able to better discriminate between biased headlines and unbiased headlines. This ability was impaired, however, when the headlines had a leaning toward viewpoints that align with one's own beliefs. An interesting finding was that having a lot of trust in the news also weakened the ability to accurately discriminate between biased and unbiased headlines. Those with no trust rated all headlines across all bias conditions as higher in bias.

The finding that participants were worse at identifying bias when the news source was aligned with their political beliefs can be explained by the Social Identity Theory (SIT), which proposes that people form their social identities based on the groups with which they identify. This theory helps to explain the attitudes and behaviors that people form towards their ingroup(s) and outgroup(s) (Brown, 2000). From the SIT perspective, the results indicate that participants have trouble rating headlines as biased if they reinforce certain biases or stereotypes associated with certain groups (e.g., ingroup or outgroup). The finding that participants who identified as Independent did the best in detecting bias levels across all three political leanings supports this assertion. It is possible that those with more centric political affiliation, or no affiliation at all, can better detect overall bias due to a lack of bias towards either political leaning.

The significant difference in bias detection between the control and treatment groups could be explained by the hostile media effect, a phenomenon in which people tend to perceive news coverage of controversial events as biased against their point of view, regardless of the actual content of the news coverage. There is no widely accepted definition for the hostile media effect (Perloff, 2015), but it can commonly be agreed that it involves the preexisting attitudes on issues and media literacy (Vraga et al., 2009) to be a driving factor in the perception of news bias. Despite the participants in the treatment group being given anti-bias training with some tools to objectively analyze the news headlines, the resistance to news headlines not aligned with their attitudes may have been a barrier to more accurate ratings of bias levels in news headlines. People with strong partisanship or opinions can have a harder time being open to opposing viewpoints and learning tools that can help them navigate media (Vraga and Tully, 2015, Eveland & Shah, 2003).

Overall, the data presented for news trust is consistent with the prediction of those who have little to no trust in news. An interesting side finding is that those with more trust in the news had better accuracy when rating the centered headlines compared to those with no trust. Considering that participants were not aware of the news sources for each headline, it is difficult to determine if the source is a factor in their trust levels. Since participants were given the news trust questions before completing the task,

participants were possibly primed to view headlines as more or less biased based on their trust in the news.

Future research should investigate the role of news trust and partisan affiliation in the bias detection of news headlines. Additionally, future research will have to look at ways to improve the effectiveness of brief intervention training. The training administered in this study was developed by the researcher, so it would possibly be beneficial for future research to utilize professional training. Using professional training will likely improve the effectiveness of the educational content. The headlines, however, were taken straight from news sources, which made it difficult to use headlines that included entirely biased or entirely unbiased language. Using linguistic tools, the creation of objectively biased or unbiased headlines could be better to use instead of real headlines. It would provide more control over bias levels.

Since most pieces of training are implemented as a requirement for jobs and some academic institutions, it is important to pinpoint exactly what elements of training are most or least effective. If organizations and institutions truly aim to improve certain aspects of their work environment, whether it be DEI (Diversity Equity, and Inclusion), communication, or understanding of policies it is important to have strong training/interventions. In terms of society, it would improve overall communication and decision-making. It is impossible to not be completely unbiased but having the ability to identify bias in the world, and in oneself, would be a major step for society (Perry et al. 2015). Politicians could come up with better laws, organizations would have better communication and collaboration, and people of all ages can have the tools needed to navigate media and information. This would allow people to combat the influences of others and can formulate their own opinions. Rather than focusing on reducing bias itself, reducing the effects of bias on behavior could be effective (FitzGerald et al., 2019). People can create their belief systems and morals without the profound effects of media and other environmental influences. Although bias is unavoidable, people can lower the effects of bias on their judgment and decision-making. Without the proper tools in this influential world, people can easily succumb to the influences of others. However, when the effort is put in and there is access to knowledge, people can acquire the skills needed to effectively navigate the social world.

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