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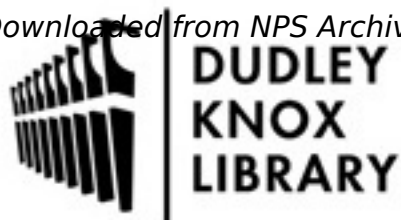
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# Personality factors and self-reported political news consumption predict susceptibility to political fake news<sup>☆</sup>

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## ABSTRACT

The existence of fake news on social media is likely to influence important issues such as elections, attitudes toward public policy, and health care decisions. Studies have shown that individual differences predict participants' ability to discern real and fake news. The present study examined whether personality factors and news consumption predict an individual's political news discernment. Participants ( $N = 353$ ) judged the accuracy of true and false political news headlines, completed a personality inventory, and reported how many hours they obtained political news from various sources in a typical week. Regression analyses revealed that greater levels of agreeableness, conscientiousness, open-mindedness, lower levels of extraversion, and fewer hours of news consumption were related to better news discernment. Participants also showed a bias toward headlines consistent with their self-reported political ideology, and this bias was related to consumption of ideologically biased news sources. These results extend those that have identified individual differences in news discernment, demonstrating that personality factors and news consumption are related to the ability to discern between true and false political news.

## 1. Introduction

Fake news, manufactured information that resembles legitimate news media content (Lazer et al., 2018), is a feature of the social media landscape (Vosoughi et al., 2018). For example, fake political news had a persistent presence on Facebook and Twitter during the 2016 US presidential election (Allcott & Gentzkow, 2017; Bovet & Makse, 2019). In addition to elections, fake news may influence public opinion on important issues, such as climate change (Van der Linden et al., 2017) and health care (Merchant & Asch, 2018). Furthermore, exposure to fake news on important public issues reduces trust in mainstream media (Ognyanova et al., 2020).

In laboratory settings, fake news discernment is assessed by having participants judge the accuracy of a set of true and false news headlines. Studies have identified several individual differences in the ability to discern true and false headlines (Bronstein et al., 2019; Pennycook & Rand, 2019, 2020). While reviewing the literature that examines an individual's susceptibility to fake political news, Sindermann, Cooper, and Montag (2020) noted a paucity of research on the relationship between personality traits and susceptibility to fake news, and suggested

that researchers examine the relationship between an individual's news consumption and susceptibility to fake news. The present study follows this recommendation and examined the relationship between personality factors, news consumption, and perceived accuracy of true and false news headlines.

The first objective of the present study was to examine how personality factors are related to news discernment. Given that personality factors influence an individual's judgments across a variety of tasks (e.g., Byrne et al., 2015; Lauriola & Levin, 2001), it is plausible that they also influence judgments of news headlines. Fake news is a specific form of misinformation. Therefore, susceptibility to fake news may be related to believing misleading post event information in the three-stage misinformation paradigm (e.g., Loftus, 2005). Supporting this line of inquiry, studies have found relationships between personality factors, or their facets, and the misinformation effect. For example, Liebman et al. (2002) found that participants with greater facets of openness to experience (the value facet) and agreeableness (the modesty and altruism facets) were more susceptible to misinformation. Alternatively, Doughty et al. (2017) reported that lower levels of openness, as well as lower levels of extraversion and neuroticism, were related to greater

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susceptibility to misinformation, whereas greater levels of agreeableness were positively related to accurate responding. Thus, this study seeks to build upon the literature on the relationship between personality factors and an individual's susceptibility to misinformation.

Sindermann, Cooper, and Montag (2020) suggested that conscientiousness and openness to experience should be correlated with lower susceptibility to fake news. Yet, few studies have directly examined how personality relates to fake news. Of those that have, additional research is needed with more reliable measurements of personality factors and of news discernment. For instance, Wolverson and Stevens (2019) reported that extraversion and openness to new experiences were negatively related to identifying fake news. However, their results should be interpreted cautiously for several reasons: personality factors were measured with a 10-item measure, the analyses were based on dichotomized responses to single personality factor items, and fake news identification was measured with participants selecting which of nine headlines they believed were fake. Similarly, Sindermann, Schmitt, et al. (2020) reported a small negative correlation between extraversion and news discernment. In their study, Sindermann, Schmitt, et al. (2020) created the fake news headlines and participants made binary responses to those headlines. Creating headlines allows researchers to control for prior exposure. However, utilizing headlines that exist prior to the study may have greater ecological validity. Most fake news studies have participants rate the accuracy of headlines on a scale (e.g., 1 to 4) to measure belief in a more sensitive manner than dichotomous judgments (Bronstein et al., 2019; Calvillo et al., 2020; Pennycook et al., 2018; Pennycook et al., 2020; Smelter & Calvillo, 2020). Thus, it may be useful to examine the relationships between personality factors and news discernment with news headlines that have circulated on social media and with those that have a more sensitive response scale.

The second objective of the present study was to examine the relationship between news consumption and news discernment. Sindermann, Cooper, and Montag (2020) suggested that consuming news sources with a variety of political leanings may result in more accurate fake news detection. Conversely, individuals who reside in an ideologically homogeneous media environment may be particularly susceptible to fake news. With regard to news media diet, Sindermann, Elhai, et al. (2020) found that the openness personality factor was positively correlated with the number of news sources consumed. The present study builds on these results by examining how the number of news sources consumed, as well as their political leaning, relate to news discernment.

In addition to personality factors and news consumption, political bias may impact the perceived accuracy of news headlines. A consistent finding in fake news studies is that participants show a bias toward politically concordant headlines: more liberal participants perceive pro-liberal headlines as more accurate than pro-conservative headlines, whereas more conservative participants perceive pro-conservative headlines as more accurate than pro-liberal headlines (Bago et al., 2020; Pennycook et al., 2018; Pennycook et al., 2020; Pennycook & Rand, 2019, 2020; also see Faragó et al., 2019). Because personality factors relate to other biases, such as overconfidence (Schaefer et al., 2004) and the confirmation bias (Melinder et al., 2020), we examined how personality factors relate to political bias in judgments of news headlines.

The present study tested Sindermann, Cooper, and Montag's (2020) predictions about the relationships between personality factors, news consumption, and news discernment. First, we predicted that extraversion, negative emotionality, and agreeableness would negatively correlate with news discernment, whereas conscientiousness and open-mindedness would positively correlate with news discernment. These predictions follow from previous studies that found a negative relationship between extraversion and identifying fake news (Wolverson & Stevens, 2019), a positive relationship between emotionality and a greater belief in fake news (Martel et al., 2020), a positive relationship between agreeableness and greater susceptibility to misinformation

(Liebman et al., 2002), and Sindermann, Cooper, and Montag's (2020) suggestion that conscientiousness and openness to experience should be correlated with lower susceptibility to fake news. Second, we predicted that participants who reported consuming more hours of news, particularly from sources that varied in political leaning, would perform better on the news discernment task. Third, we predicted that the absolute value of news bias would be negatively correlated with news discernment. Finally, we predicted that participants' political ideology would be correlated with news discernment, their bias in news consumption, and their political bias in headline ratings.

## 2. Method

### 2.1. Preregistration

Prior to data collection, we preregistered our hypotheses, data collection plan, and planned analyses on the Open Science Framework (OSF). Materials and data are also available on the OSF page for this project: [https://osf.io/dgcfe/?view\\_only=52a221ab399a416da538e93b9bfb0204](https://osf.io/dgcfe/?view_only=52a221ab399a416da538e93b9bfb0204).

### 2.2. Sample

The sample size was determined by choosing the smallest correlation that would be meaningful,  $r = 0.15$ . Using G\*Power (Faul et al., 2007), we determined that a sample of 346 participants would provide power of 0.80 (with two-tailed  $\alpha = 0.05$ ). We collected data in batches until we had at least 346 participants who met inclusion criteria (described in Section 2.3). The participants were Mechanical Turk workers who resided in the US and were provided monetary compensation. Of the 526 participants who completed the study, 353 of them met inclusion criteria. In the final sample, 179 identified as women, 173 as men, and 1 participant declined to provide their gender. Participants ranged in age from 19 to 78 ( $Mdn = 37$ ) years, and 163 identified as Democrats, 104 as Republicans, and 86 did not identify with either political party.

### 2.3. Materials and procedure

The materials consisted of a headline evaluation task, a personality measure, and items measuring news consumption and political ideology. The headline evaluation task included 24 news headlines with photographs. The news headlines were divided equally into true or false, and pro-liberal or pro-conservative. False headlines were taken from a fact checking website, [Snopes.com](https://snopes.com), which had rated them false. True headlines were taken from the website for National Public Radio, an independent, nonprofit media organization in the US ([NPR.org](https://www.npr.org)). All headlines appeared on their respective websites between January and April 2020. Headlines were edited to be similar in tone and font, and photographs were modified to be identical in size. Example headlines appear in Fig. 1, and all headlines are available on the study's OSF page. Participants rated each headline on a scale from 1 (*not at all accurate*) to 4 (*very accurate*).

Personality factors were assessed with the Big Five Inventory-2-S (BFI-2-S; Soto & John, 2017). The BFI-2-S contains 30 statements to which participants rate their agreement on a scale from 1 (*disagree strongly*) to 5 (*agree strongly*). There are six statements, half reverse coded, for five factors: extraversion, agreeableness, conscientiousness, negative emotionality, and open-mindedness.

To assess news consumption, participants were asked to select which sources they obtain political or election news from in a typical week (from a list of 45 sources). Participants then reported how many hours they obtained news from each source they initially selected. The 45 sources were those rated by [Allsides.com](https://allsides.com), which provides a political bias rating for each source that is scored as either left, lean left, center, lean right, or right.

After providing informed consent, participants completed the

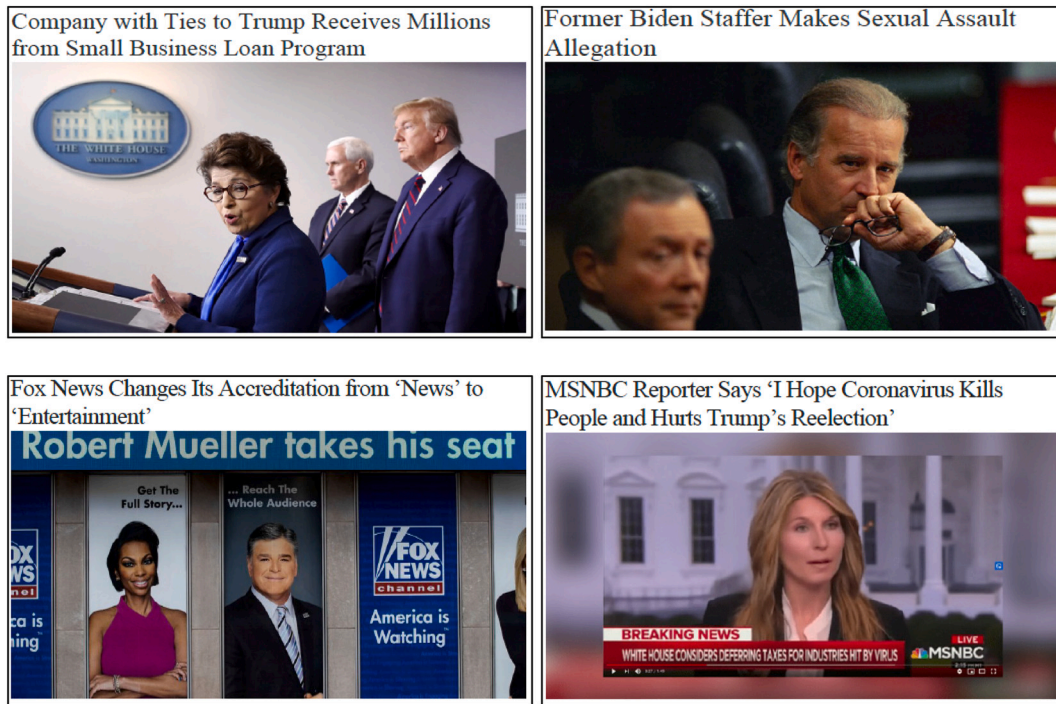


Fig. 1. Example true (top) and false (bottom) pro-liberal (left) and pro-conservative (right) news headlines.

headline evaluation task, completed the BFI-2-S, and then responded to the news consumption items. Next, participants were asked to report their age, gender, political party identification, and political ideology. The political ideology item asked participants to rate their ideology on scale from 1 (*extremely liberal*) to 7 (*extremely conservative*). Finally, participants were asked two honesty check questions, were debriefed, and were paid for their participation. The honesty check questions asked if participants looked up any of the headlines online and if they responded randomly or without reading any of the questions. We pre-registered the inclusion criteria of responding ‘no’ to both of these questions. There were 173 participants who responded ‘yes’ to at least one of these two questions and were excluded from analysis. We used CloudResearch to conduct this study (Litman et al., 2017).

### 3. Results

#### 3.1. News discernment

Consistent with previous research (Calvillo et al., 2020; Pennycook & Rand, 2019, 2020; Smelter & Calvillo, 2020), news discernment was calculated as the difference between the perceived accuracy of true headlines and false headlines. Mean news discernment, along with means for the personality factors, participants’ ideology, and news

consumption are presented in Table 1. We predicted that news discernment would be negatively correlated with extraversion, negative emotionality, and agreeableness, and positively correlated with conscientiousness and open-mindedness. Table 2 contains the correlations between personality factors and news discernment. As predicted, news discernment was positively correlated with conscientiousness ( $p = .006$ ) and open-mindedness ( $p < .001$ ). However, news discernment was positively correlated agreeableness ( $p < .001$ ), and not significantly correlated with extraversion ( $p = .391$ ) or negative emotionality ( $p = .447$ ).

The total number of hours spent per week consuming news was calculated by taking the sum of the number of hours reported for each news source. Because there were some impossible values, the total number of news hours were winsorized by replacing outliers with the 95th percentile for this distribution (42.15 h/week). For example, one participant reported consuming 384.5 h of news per week. Extreme values were replaced with 42.15 h to prevent their undue influence on relationships. We predicted that the number of hours of political and election news participants watched would be positively correlated with news discernment. The opposite occurred: the more participants reported watching news, the worse their news discernment ( $p = .011$ ). This relationship is shown in Table 1. We also predicted that more biased news consumption would be related to worse news discernment. We used the bias ratings from Allsides.com to calculate news consumption bias. We coded left ratings as  $-2$ , leaning left as  $-1$ , center as  $0$ , leaning right as  $1$ , and right as  $2$ . We then calculated the product of the number of hours a source was consumed and its bias rating, and summed these products for all of the sources for each participant. This measure is nonbiased at  $0$ , liberal bias extends negatively from  $0$ , and conservative bias extends positively. We predicted that the more biased news consumed by participants, the worse their news discernment. We pre-registered the prediction that the absolute value of news consumption bias would be negatively correlated with news discernment. This was not the case: the absolute value of news consumption bias was not significantly related to news discernment,  $r(351) = -0.01, p = .874$ . We also examined the relationship between the variety of news sources consumed and news discernment. Sindermann, Cooper, and Montag

Table 1

Descriptive statistics for variables.

Variable	M	SD	Min	Max
News discernment	0.54	0.51	-0.83	2.00
Political bias	-0.30	0.65	-2.00	2.17
Extraversion	3.08	0.86	1.00	5.00
Agreeableness	3.81	0.81	1.33	5.00
Conscientiousness	3.87	0.84	1.00	5.00
Negative emotionality	2.49	0.98	1.00	5.00
Open mindedness	3.72	0.82	1.33	5.00
Ideology	3.66	1.81	1.00	7.00
Hours of news	12.55	11.83	0.00	42.15
News consumption bias	-6.61	12.50	-97.00	40.00
Number of leanings	2.61	1.23	0.00	5.00



**Table 2**

Correlation matrix of news discernment, personality factors, participants' political ideology, and news consumption. Internal consistency (Cronbach's  $\alpha$ ) is presented in parentheses for personality factors.

Variable	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.
1. News discernment	–0.34***	–0.05	0.22***	0.15**	–0.04	0.36***	–0.31***	–0.14*	–0.05	0.08
2. Political bias	–	–0.01	–0.05	0.00	–0.02	–0.21***	0.52***	0.05	0.22***	0.00
3. Extraversion		(0.77)	0.27***	0.41***	–0.55***	0.32***	0.03	–0.01	–0.03	0.01
4. Agreeableness			(0.80)	0.48***	–0.40***	0.26***	–0.04	–0.10	–0.05	–0.06
5. Conscientiousness				(0.83)	–0.52***	0.24***	0.08	–0.08	0.00	–0.02
6. Negative emotionality					(0.85)	–0.23***	–0.09	0.07	0.01	0.04
7. Open mindedness						(0.78)	–0.26***	–0.08	–0.10	0.08
8. Ideology							–	0.00	0.21***	0.07
9. Hours of news								–	–0.54***	0.38***
10. News consumption bias									–	–0.16**
11. Number of leanings										–

\*  $p < .05$ .  
 \*\*  $p < .01$ .  
 \*\*\*  $p < .001$ .

(2020) suggested that viewing a variety of news sources, particularly those with different political leanings, may improve fake news detection. We used [Allsides.com](http://Allsides.com) ratings to place news sources in groups based on their political leaning: left, lean left, center, lean right, and right. We then examined how many groups from which a participant consumed news. These scores ranged from 0 to 5. The number of groups a participant consumed news was not significantly correlated with news discernment,  $p = .119$ .

We further explored the unexpected finding that more news consumption was negatively related to news discernment. These analyses were not preregistered. We examined the relationship between time consuming news with different political slants and news discernment. The distributions of the number of hours for each political slant (left, lean left, center, lean right, and right) are skewed because the mode for each distribution is 0. Therefore, we computed nonparametric Spearman correlations. The number of hours participants consumed news that leans right was negatively correlated with their news discernment,  $r_s(351) = -0.17, p = .002$ , whereas the number of hours participants consumed news that was left,  $r_s(351) = 0.10, p = .058$ , leans left,  $r_s(351) = -0.09, p = .096$ , center,  $r_s(351) = 0.01, p = .813$ , and right,  $r_s(351) = 0.00, p = .093$ , did not significantly predict news discernment. The negative relationship between news consumption and news discernment appears to be driven by the consumption of news that leans right. We also confirmed that the relationship between hours of news consumption and news discernment was significant with a nonparametric test,  $r_s(351) = -0.14, p = .009$ . Next, we examined the relationship between hours consuming specific news sources and news discernment. We selected the eight sources consumed by at least 100 participants. Because the mode of each news source's hours of consumption was zero, we again used nonparametric tests. The more hours participants consumed the Washington Post, the better their news discernment,  $r_s(351) = 0.16, p = .002$ , whereas the more hours participants consumed Fox News, the worse their news discernment,  $r_s(351) = -0.15, p = .005$ . Hours consuming ABC News, BBC News, CBS News, CNN, NBC News, and the New York Times did not significantly predict news discernment. We report all of these correlations in the Supplementary Material.

We preregistered a multiple regression to simultaneously examine the relationships between news discernment and the five personality factors, participants' ideology, and the number of news hours reported. Of the news consumption indices, we included the total number of news hours consumed in the model because it had the strongest bivariate correlation with news discernment. This selection rule was preregistered. The overall model explained a significant amount of variance in news discernment,  $F(7, 345) = 15.80, p < .001, R^2 = 0.24$ . The regression coefficients are presented in Table 3. The coefficients for extraversion, participants' ideology, and number of news hours were negative, whereas coefficients for agreeableness, conscientiousness, and open-mindedness were positive. The coefficient for negative

**Table 3**

Regression coefficients for relationships between news discernment and personality factors, political ideology, and hours of news consumed.

Variable	B	SE	t	p	95% CI
Extraversion	–0.13	0.04	–3.60	<.001	[–0.19, –0.06]
Agreeableness	0.08	0.04	2.20	.028	[0.01, 0.15]
Conscientiousness	0.07	0.04	1.99	.047	[0.00, 0.14]
Negative emotionality	0.01	0.03	0.18	.857	[–0.06, 0.07]
Open-mindedness	0.19	0.03	5.66	<.001	[0.12, 0.25]
Political ideology	–0.07	0.01	–4.59	<.001	[–0.09, –0.04]
Hours of news	–0.01	0.00	–2.00	.046	[–0.01, 0.00]

emotionality was not significant.

News discernment is the difference between the perceived accuracy of true and false headlines; thus, a variable may correlate with news discernment because it increases perceived accuracy of true headlines, decreases perceived accuracy of false headlines, or both. We further examined the relationships between discernment and personality factors, political ideology, and news consumption by correlating them with perceived accuracy of true and false headlines separately. These analyses were not preregistered. Table 4 contains these correlations. Agreeableness, conscientiousness, and open-mindedness were negatively correlated with perceived accuracy of false headlines. Additionally, open-mindedness was positively correlated with perceived accuracy of true headlines. Participants' ideology was negatively correlated with perceived accuracy of true headlines, and hours of news reported was positively correlated with perceived accuracy of both true and false headlines.

3.2. Political bias in headline ratings

Participants' perceived accuracy of headlines are biased toward their ideology (e.g., Pennycook et al., 2018). We wanted to examine how personality factors and participants' ideology and news consumption

**Table 4**

Correlation coefficients between personality factors, political ideology, hours of news consumption, and perceived accuracy of true and false headlines.

Variable	True	False
Extraversion	0.01	0.05
Agreeableness	–0.02	–0.25***
Conscientiousness	–0.04	–0.18**
Negative emotionality	0.01	0.05
Open-mindedness	0.15**	–0.26***
Ideology	–0.30***	0.09
Hours of news	0.15**	0.27***

\*\*  $p < .01$ .  
 \*\*\*  $p < .001$ .

related to their political bias in headline ratings. We calculated political bias by subtracting the perceived accuracy of pro-liberal headlines from that of pro-conservative headlines. A negative value indicates a liberal bias and a positive value indicates a conservative bias. Across all participants, political bias was negative ( $M = -0.30$ , 95% CI  $[-0.37, -0.24]$ ). The prediction that participants' ideology would be positively correlated with their political bias in headline ratings was supported,  $r(351) = 0.52$ ,  $p < .001$ . We preregistered an exploratory multiple regression analysis predicting political bias in headline ratings with personality factors, participants' ideology, and their news consumption bias as predictors. Of the news consumption indices, we included news consumption bias in the model because it had the strongest bivariate correlation with political bias. This selection rule was preregistered. The overall model explained a significant amount of variance in political bias in headline ratings,  $F(7, 345) = 20.39$ ,  $p < .001$ ,  $R^2 = 0.29$ . Regression coefficients are presented in Table 5. The coefficients for participants' ideology and the bias of their news were positive, and none of the coefficients for personality factors were significant.

#### 4. Discussion

In a multiple regression analysis, we found that agreeableness, conscientiousness, and open-mindedness were positively related to political news discernment, whereas extraversion, political conservatism, and the number of hours participants consume political news were negatively related. The negative relationship between political conservatism and news discernment replicates those from previous studies (Calvillo et al., 2020; Pennycook & Rand, 2019). Agreeableness and conscientiousness were related to lower perceived accuracy of false news, whereas open-mindedness was related to both less belief in false news and greater perceived accuracy of true news. These results provide support for the predictions made by Sindermann, Cooper, and Montag (2020). Additionally, participants' political conservatism predicted less perceived accuracy of true news.

An unexpected finding was that the more hours participants reported consuming political news, the worse their ability to discern true from false news. As expected, more news consumption was related to greater accuracy ratings of true news. However, more news consumption was also related to greater perceived accuracy of false news, and this relationship was stronger than the true news relationship, which resulted in a negative relationship between news discernment and news consumption. The overall negative relationship between hours of news consumption and news discernment appears to be driven by news sources that lean right, specifically Fox News. Participants' consumption of a greater variety of sources from different political slants was not significantly related to news discernment, which is inconsistent with the prediction of Sindermann, Cooper, and Montag (2020). Additional research is needed to better understand the relationship between news consumption and susceptibility to fake news.

Participants exhibited a political bias in their ratings of headlines, replicating previous studies (Bago et al., 2020; Pennycook et al., 2018; Pennycook et al., 2020; Pennycook & Rand, 2019, 2020). Participants who were more liberal perceived the accuracy of pro-liberal headlines as greater than pro-conservative headlines, whereas participants who were more conservative participants did the opposite. A regression analysis revealed that only participants' ideology and the bias of the news they consumed were significantly related to their bias in headline ratings—personality factors did not have significant relationships with political bias.

Limitations of the present study include the sampling of material and participants, and the self-reporting of news consumption. The headlines in the study appeared on websites a few months prior to data collection. The false headlines had been circulated on the internet, which adds to the ecological validity of the study. However, the sample of headlines may not have been representative of participants' knowledge of political news. Similarly, our sample of Mechanical Turk workers may not be

**Table 5**

Regression coefficients for predictors of political bias in headline ratings.

Variable	B	SE	t	p	95% CI
Extraversion	0.01	0.04	0.20	.838	$[-0.08, 0.09]$
Agreeableness	0.00	0.04	0.10	.919	$[-0.08, 0.09]$
Conscientiousness	-0.02	0.04	-0.39	.694	$[-0.11, 0.07]$
Negative emotionality	0.01	0.04	0.12	.904	$[-0.07, 0.08]$
Open-mindedness	-0.06	0.04	-1.35	.177	$[-0.13, 0.03]$
Ideology	0.17	0.02	9.87	<.001	$[0.14, 0.21]$
News consumption bias	0.01	0.00	2.55	.011	$[0.00, 0.01]$

representative of the population in terms of their personality, ideology, news consumption, or news discernment. Future research could examine the generalizability of our findings with different headlines (including novel headlines created by researchers) and a different source of participants. The self-reporting of news consumption is another limitation. Participants may overreport the amount of news they watch on television (Prior, 2009) and read online (Vraga & Tully, 2020). If certain participants overreported more than others, this could explain the relationship between news consumption and perceived accuracy of true and false news. Pennycook and Rand (2020) found that participants who overclaimed their knowledge had greater perceived accuracy of false news. The tendency to overclaim could have led to greater reports of news consumption and greater perceived accuracy of headlines. Future research should examine news consumption with more objective measures. We also note that the effect sizes reported in the present study were small. Future research should examine other predictors of news discernment and bias to explain some of the variance not explained by the present study's set of predictors.

#### 4.1. Conclusions

The present study helps elucidate the relationships between personality factors, news consumption, and the ability to discern between true and false news headlines. Agreeableness, conscientiousness, and open-mindedness were related to lower perceived accuracy of false news, whereas the number of hours participants consumed political news was related to greater perceived accuracy of false news. Thus, certain personality factors may be related to susceptibility to fake news, whereas exposure to news may not.

#### CRediT authorship contribution statement

**Dustin P. Calvillo:** Conceptualization, Methodology, Formal analysis, Investigation, Resources, Writing – original draft. **Ryan J.B. Garcia:** Conceptualization, Methodology, Formal analysis, Writing – review & editing. **Kiana Bertrand:** Methodology, Writing – review & editing. **Tommi A. Mayers:** Methodology, Writing – review & editing.

#### Declaration of competing interest

None.

#### Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.paid.2021.110666>.

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