Perceiving Fact-Checks as Biased but Nevertheless Persuaded? Effects of Fact-Checking News Delivered by Partisan Media*

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Abstract

Abundant of scholarly works explored the corrective intervention on political misperception. While prior studies have focused on the effects of fact-checking news delivered by neutral third parties such as fact-check organizations, little is known as to the effect of fact-checking news delivered by partisan media. Against this background, we bring a focus on the case of South Korea, where legacy news organizations—including partisan media—are playing a leading role to produce the fact-checking news. Based on the frameworks of motivated reasoning and the hostile media effect, we investigate the corrective effect of fact-checking news—as well as perceived bias toward such news—when the fact-checking news is delivered by partisan media. Drawing on an original experiment conducted in South Korea, we confirm the corrective effects of fact-checking news even if such news is delivered by partisan media rather than neutral third parties. At the same time, we observed that perceived bias on the fact-checking news systematically varied as a function of the political slant of partisan media and the valence of the news, while the intensity of perceived bias increased as one's ideological strength increased.

Keywords: fact-checking, correction, persuasion, motivated reasoning, partisan media, bias perception

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An effective deliberation among public is regarded as a keystone of thriving democracies, and in that regard, modern political systems squarely depend upon informed decisions of citizens (Delli Carpini & Keeter, 1996). Yet, a propagation of rumors, misinformation, and digitally coordinated disinformation campaigns becomes an increasing concern for the public and policy makers alike (Allcott & Gentzkow, 2017; Lazer et al., 2018). While a wide circulation of factually dubious information is not entirely new to political arena, a growing trend of digitally disseminated rumors and misinformation—often conveniently termed as a "fake news" phenomenon—is increasingly recognized as a serious threat to liberal democratic societies. Either based on unsubstantiated rumors or based on factually wrong beliefs, many of the misinformed behave differently than those who are accurately informed (Kuklinski et al., 2000). They often disagree about basic facts about many public issues, and continue to believe and rely on such false information when making political judgments (Nyhan & Reifler, 2010; Thorson, 2016).

Motivated by these normative concerns, fact-checking news, originally initiated in the U.S., quickly expanded to nearly 80 countries with about 300 organizations over the past few years (Stencel & Luther, 2020). It is thereby deemed as a global phenomenon (Amazeen, 2020) as well as rather a pervasive form of news coverage to deliver political information to general citizens (Graves, 2016). As such, abundance of research has been conducted regarding the effectiveness of fact-checking news that convey corrective information (i.e., the news adjudicating a target information as false based on factual information; Nyhan et al., 2020; Nyhan & Reifler, 2010; Wood & Porter, 2019). Of particular interest, prior works have focused on the question of whether individuals change their prior belief followed by the verdict of fact-checking news, even when the valence of fact-checking news is counter-attitudinal to one's political ideology or partisanship.

While prior studies have produced invaluable insights for the relationship between the content valence of fact-checking news and one's prior attitude, the current tendency of established news organizations (e.g., *New York Times*, *CNN*, and *Washington Post*) to take part in this journalistic intervention further complicates the issue of assessing effectiveness of fact-checking messages. People admittedly rely on heuristic cues about the source of a message in political information processing (Zaller, 1992), and the role of the source cues becomes all the more explicit especially when the source is a so-called partisan media

with a known political slant (Turner, 2007). Indeed, previous works have established that people tend to perceive political bias of the news content when it is delivered by a partisan media (Coe et al., 2008; Stroud et al., 2014; Turner, 2007). Therefore, when legacy and partisan media increasingly take part in producing fact-checking messages, it is quite possible that the effectiveness of such messages would be further contingent upon source cues beyond mere content valence of a fact-checking messages. While this observation is much warranted, prior studies on this topic largely ignored this possibility but instead exclusively focused on the effectiveness of a fact-checking message that is delivered by a neutral third party (such as *Factcheck.org*: e.g., Garrett & Weeks, 2013; Nyhan & Reifler, 2010) or the one accompanied with platform-induced labels (e.g., a "disputed" tag on Facebook: Clayton et al., 2020).

In this paper, we address this theoretical gap by investigating (1) the effect of the fact-checking news delivered by partisan media, and also, (2) looking at the bias perception of fact-checking news itself when it is delivered by partisan media. For this purpose, we apply the theoretical lenses from misinformation and media bias literature—motivated reasoning (Kunda, 1990) and the hostile media effect (Vallone et al., 1985)—while leveraging an original survey experiment conducted in South Korea. The media environment of South Korea is quite distinct from the case of the U.S., in the sense that legacy news organizations play a leading role in producing fact-checking messages other than non-profit organizations. The only one of its kind, *SNU FactCheck*, exclusively dedicated to archive fact-checking news produced by other established news media rather than actively producing and disseminating such news. Thus, the exposure to the fact-checking news by partisan media is rather common in South Korean context, which makes it ideal setting for investigating the effectiveness of fact-checking messages delivered by partisan media.

Effect of Fact-Checking News and Motivated Reasoning

The increase of fact-checking news reports, heavily relevant to the rapid dissemination of misinformation and fake news (Graves, 2016; Lazer et al., 2018), has promoted rich academic works exploring the effects of fact-checking news that deliver the corrective intervention. Political misperceptions, however, turned out to be much resilient to

corrections (Walter et al., 2020). The fundamental reason why it is difficult to attenuate misperception with fact-checking is because "[e]very opinion is a marriage of information and predisposition" (Zaller, 1992, p. 6). Namely, the reduction of political misperception requires a combination between new, corrective information from fact-checking news and old, conflicting predisposition such as political ideology and partisanship. People disproportionately gravitate toward information that conforms to their partisan priors (Garrett et al., 2016), therefore tend to evaluate attitudinally congruent information as more convincing and valid *regardless of its veracity*; conversely, they likely to perceive attitudinally inconsistent information as weak in their argument strengths, therefore likely to reject such attitudinally inconsistent information. This is in line with the directionally motivated reasoning, which emphasizes the role of directional goals in information processing (Bolsen et al., 2014; Flynn et al., 2017; Kunda, 1990; Taber & Lodge, 2006).

Nyhan and Reifler (2010) have experimentally demonstrated that the prior beliefs on misinformation are reinforced after being debunked by the correction. This finding, the so-called "backfire effect," has substantially attracted scholarly attention and triggered abundance of research that disputes the effectiveness of the intervention on political misperceptions. However, findings by Nyhan and Reifler (2010) were not consistently replicated in the subsequent research, spanning from null effect (e.g., Garrett & Weeks, 2013) to persuasive effect reducing misperception (e.g., Fridkin et al., 2015; Guess & Coppock, 2018). Importantly, Wood and Porter (2019) tested 52 issues that have the potential to provoke a backfire effect with about 10,000 subjects, yet only to find persuasive effects or null effects at best. The subsequent research by Nyhan et al. (2020) confirmed that the correction overall reduces political misperceptions while the effects were further qualified by individual predispositions (i.e., directional goals). A recently conducted meta-analysis (Walter et al., 2020) that synthetically summarized the effect of fact-checking news offered similar conclusions, in that fact-checking messages, overall, positively reduce political misperceptions, although the precise effect size of corrective information exposure is systematically qualified by the degree of one's directionally motivated reasoning. Likewise, De Benedictis-Kessner et al. (2019) showed that even partisan media can change the attitudes of news consumers regardless of the consistency of a given issue with ones' prior attitude. Taking into account the evidence, we propose the following:

H1: As a result of exposure to fact-checking news, prior attitude on an issue would be changed towards the direction adjudicated by fact-checking news.

H2: The persuasive effects of fact-checking news would be diminished when the valence of misinformation is counterattitudinal to an individual.

The context of this study importantly departs from the previous works in the sense that we consider a situation where the fact-checking news is delivered by a partisan news media. Under this particular context, there is reason to believe that the effect of fact-checking news may vary by the perceived political slant of partisan media that delivers such corrective information. Most importantly, prior works on partisan cue-tacking (particularly, the one based on a label-switching approach) and directionally motivated reasoning suggest that simple source cues (such as media labels or party cues) of a message may evoke similar motivated process as to the content valence of a message (Baum & Groeling, 2009; Petersen et al., 2013). For instance, Cohen (2003) has tested whether attitudes on a social policy are primarily dependent on the actual content of social policy (content valence) or the position of ones' political party (source cues), showing that one's attitudes towards social policy are exclusively shaped by the positions of the political party who advocates such policies rather than the actual contents of the policy. The finding is applicable to the context of the present study since the source of the fact-checking news is the news media that is perceived to have an unambiguous political slant. Surely, the slant of partisan media is not as explicit as the position of a political party. However, we expect that the slant of media would likely function as a similar heuristic cue to evoke partisan identity (Iyengar & Hahn, 2009; Morris, 2005; Stroud, 2008), especially considering a rather high degree of media-party political parallelism in South Korea (Rhee et al., 2011). Thus, we posit the following research question:

H3: The effect of fact-checking news would be moderated by the political slant of partisan media that deliver fact-checking news.

Bias Perception on Fact-Checking News

Whether the fact-checking news on political misperception is indeed impartial or not is the issue that invites many disputes among academics and publics alike (Amazeen, 2015;

Uscinski & Butler, 2013). In any case, however, the fact-checking news is not immune to the perception of bias by individuals who consumes such news (Brandtzaeg et al., 2018; Shin & Thorson, 2017). Then, when the fact-checking news would be perceived as biased? First of all, it is rather straightforward to expect that the fact-checking news would be perceived as biased unfavorably to the side of the target (which is abjudicated as false); namely, when the content of fact-checking news is disadvantageous to the side of the target, it would likely to be perceived as unfavorable. However, the hostile media effect provides a slightly different prediction, in that the bias perception is contingent not only on the content of the fact-checking news but also on its relationship with partisanship of those who is exposed to.

Vallone et al. (1985) revealed that partisans tend to perceive any given information from news media as biased *against* their sides even when the content was neutral in its valence. Expanding the theoretical boundary to bias perception on non-neutrally valanced news, Gunther and Chia (2001) also showed that when given news content is indeed favorable toward one side, partisans perceive the news being biased favorably toward the other side *regardless of* their own point of view—although those of who have a congenial view of the content perceive less bias than the partisans with the opposite view (Gunther et al., 2001). This perceptual bias has been confirmed in various contexts including GM foods controversy (Gunther et al., 2009), the content of cable news shows (Arceneaux et al., 2012), and comments on Twitter posts conveying fact-checking news (Shin & Thorson, 2017).

Recent studies on this topic suggest that not only the content valence but also the source of the given information is crucial when it comes to its bias perception (Coe et al., 2008; Gunther et al., 2017; Reid, 2012; Turner, 2007). That is, when the source evokes group identity, individuals categorize the source as a member of their in-group (Stroud et al., 2014). Therefore, if the source is categorized based on partisanship, the perceived partisan affiliation of the source would likely serve as a heuristic cue that activates partisan identity and corresponding bias perception based on the source's ideological perspective (Turner, 2007). Turner (2007) showed that the bias perception on the news report was varied by the political slant of news media; when the news was attributed to *Fox News Channel*, the news report was perceived to be biased favorably to conservative, whereas

news attributed to *CNN* was perceived to be favorable to liberal. Relatedly, Reid (2012) confirmed that the bias perception of a given content related to one's predisposition was overridden by the political slant of the source. In his experiment, when individuals were exposed to the polling information attributed to liberal (conservative) source, they perceived the content was written favorably toward liberal (conservative) regardless of the content and an individual's political ideology.

To synthetically scrutinize the effect of content and source on bias perception, Gunther et al. (2017) investigated the pattern of bias perception with a precisely edited news article to facilitate an apparent comparison. The case exploited in their study was the controversial teaching of alternatives to evolution. As a result, respondents perceived the article to be biased favorably toward evolution when the source was the pro-evolution side and vice versa for pro-teaching side, while at the same time the bias perception varied as well by the content of the given article. Considering aforementioned evidence, we posit that the direction of perceived bias on the fact-checking news would be varied by the political slant of partisan media and content of fact-checking news at the same time.

> **H4a**: The perceived bias on fact-checking news would be varied by the content of the fact-checking news.
>
> **H4b**: The perceived bias on fact-checking news would vary by the perceived political slant of partisan media.
>
> **H5a**: Attitude-consistent fact-checking news content would be perceived as less biased, while counter-attitudinal content would be perceived to be more biased.
>
> **H5b**: Fact-checking news by in-group source would be perceived to be less biased, while fact-checking news by out-group source would be perceived to be more biased.

Bias perception of the news has been considered to be more evident among strong partisans rather than people without apparent partisanship Reid (2012) and Turner (2007). Turner (2007) confirmed that the perceived bias of a news report tends to be more pronounced among ideologues. Similarly, Reid (2012) showed that the intensity of bias

perception increases as the ideological strength of an individual. In line with the related empirical evidence, we speculate that the intensity of bias perception of fact-checking news by partisan media would be increased as a function of one's ideological strength. Therefore:

> **H6**: The intensity of bias perception on fact-checking news would be increased as the ideological strength of an individual increases.

Data and Method

Participants

In order to test our expectations, we conducted a survey experiment leveraging data from the panel of market research firm Embrain in South Korea. The firm, where has access to more than a million identity-verified individuals that closely match gender, age, and political ideology distributions of the entire Korean population, recruited a total of 531 respondents. Demographic characteristics were diverse including age (21% 18–29 years, 20% 30–39 years, 21% 40–49 years, 19% 50–59 years, 19% older), gender (51% Male), education (1% less than high school, 21% high school, 66% up to 4-year college degree, 13% postgraduate), political ideology (27% liberal, 41% moderate, 32% conservative), and party affiliation (35% Minju Party, 31% Hankuk Party, 34% Independent).[1]

Experimental Procedure

The experiment was conducted for 7 days from September 18, 2019, to September 24, 2019. We chose the economic policy issue as it was very controversial by the time when the experiment was conducted, thereby drawing considerable public attention. By administering a survey experiment during a period of heightened public attention, we also address the potential shortcomings of prior studies that lack ecological validity of fact-checking messages and motivations of respondents that may produce null or

[1] Although there are more political parties other than Minju (a catch-all, center-left party) and Hankuk (a catch-all, center-right party) in South Korea, we excluded those who support other small or extreme political parties in our sample. This is since the approval rates of those parties were substantially small, and also excluding minor political party supporters would give us more clarity in our research design and interpretation of the results.

inconsistent results (see Nyhan et al., 2020, for a similar approach). The respondents were randomly assigned to one of each experimental condition within the 3 by 2 by 2 design (ideology of respondent vs. content of fact-checking news vs. partisan slant of media) depending on the content valence of the fact-checking news and perceived political slant of partisan media. The respondents were exposed to the statements by a politician with a pseudonym (we used the pseudonym since the original figures in the fact-checking news were well renowned: see Mutz, 2007, for a similar approach). For those who assigned to the liberal-consistent condition, participants were exposed to the statement of a politician, a member of the ruling party, advocating the current economic policies:

> The legislator [pseudonym], a member of the Minju Party (the ruling party), expressed his view on the economic policies of the President Moon's administration last January 8. He argued that future economic prospects are not as murky as it seems, on the basis that "the economic growth rate of South Korea is very high compared to other OECD countries," and "proportion of low–income workers is the lowest compared to earlier years" as a result of the economic stimulus package.

On the other hand, those who assigned to the conservative-consistent condition were exposed to the statement of a politician, a member of the opposition party, criticizing the current economic policies:

> The legislator [pseudonym], a member of the Hankuk Party (the opposition party), expressed his view on the economic policies of the President Moon's administration last January 8. He criticized the current economic policy arguing that "the government is fracturing the economy," on the basis that "only economic situation of South Korea is plummeting while the economic situation of other countries is stable."

The respondents were then further prompted by the question about their degree of agreement on the politician's statement (first measure on the agreement), followed by the fact-checking news, written by The Chosun Ilbo and The Hankyoreh respectively represents conservative and liberal partisan media. The fact-checking news contained the correction on the politician's statements, pointing out that the factual basis of the

statements of the politician was wrong. Here, we used actually reported fact-checking news about the economic policy issue—thereby attaining greater verisimilitude and ecological validity.[2] Some details were slightly modified (e.g., the length of content and the names appearing in news) in order not for respondents to readily recognize had they been already exposed to the same fact checking news. Only the logo of the news media was manipulated—either purportedly written by the conservative vs. the liberal partisan media[3] —and being visibly placed on the top of the article in order for respondents to easily notice the source of the news (see from Figure A.1 to Figure A.4 in Appendix).

Table 1: Assignment of respondents in each 2 × 2 experimental group

	Statement	
	Conservative-consistent	Liberal-consistent
Conseravtive media	137 (51/55/31)	132 (41/58/33)
Liberal media	130 (43/49/38)	132 (36/56/40)

Note. Each cell is including the number of assigned respondents in each experimental group. The numbers in parentheses mean the size of respondents with each political ideology (conservatives, moderates, and liberals in order).

Lastly, after the exposure to the fact-checking message, respondents were asked their agreement on the statement of the politician again (second measure on the agreement), as well as perceived bias of the exposed fact-checking news.

Measures

Effect of Fact-Checking News

We measured the effect of fact-checking news with a repeated measure which is consistently recommended by previous research (Swire-Thompson, DeGutis, et al., 2020; Swire-Thompson, Ecker, et al., 2020). The participants answered the question, "How much do you agree on the legislator Lee's statement?" (1: 'Don't agree at all' – 7: 'Strongly agree'), once before ($M = 3.68, SD = 1.97$) and after being exposed to the fact-checking news

[2]The fact-checking news is archived in *SNU FactCheck*, which is a web platform archiving fact-checking news by major news media of South Korea. See https://factcheck.snu.ac.kr.

[3]To confirm whether this setup was appropriate, we asked the respondents about their perceived political slant of news media by asking, "How do you think about the political slant of The Chosun Ilbo (or The Hankyoreh)?," followed by a 7-point scale from 1 (= very liberal) to 7 (= very conservative). There was a significant difference between the perceived slant of The Chosun Ilbo ($M = 5.24, SD = 1.52$), and The Hankyoreh ($M = 3.22, SD = 1.52$), $t(530) = 22.3, p < .001$.

($M = 3.34, SD = 1.8$). The difference score ($M = -0.34, SD = 1.07$) was used to examine the effect of exposure to the fact-checking news.

Bias Perception

Bias perception was measured by asking participants' subjective judgment with the statement—"The news article is in favor of specific political stance"—on an 11–point Likert scale from -5 (content is consistently in favor of liberal) to 5 (content is consistently in favor of conservative; M = 0.3, SD = 2.4). As for the intensity of bias perception, we folded the original bias perception score to an absolute value ranging from 0 to 5, then rescaled to $[0, 1]$ ($M = .35, SD = .33$).

Covariates

Participants were asked to self-place their *political ideology* with a standard branching question and 7–point scale, from 1 (very liberal) to 7 (very conservative; $M = 4.08, SD = 1.24$). Then, we trichotomized the score into liberal (1 to 3: $n = 142$; 27%), moderate (4: $n = 218$; 41%), and conservative (5 to 7: $n = 171$; 32%) categories. Per *ideological strength*, similarly to Huddy et al., 2015, we folded the ideology measure to yield strength of ideology measure (moderate: $n = 218$ [41%], weak ideologue: $n = 186$ [35%], and strong ideologue: $n = 127$ [24%]). To measure the degree of trust in news media (*media trust*), we used eight questions asking the perceived accuracy and fairness of news media in South Korea with 7-point scales ($M = 2.5$, $SD = 1.18$, $\alpha = .96$). *Involvement* was measured with two questions asking the importance of the issue to respondents ($M = 4.74$, $SD = 1.44$, $r_{Spearman-Brown} = .87$).

Results

Effect of Fact-Checking News

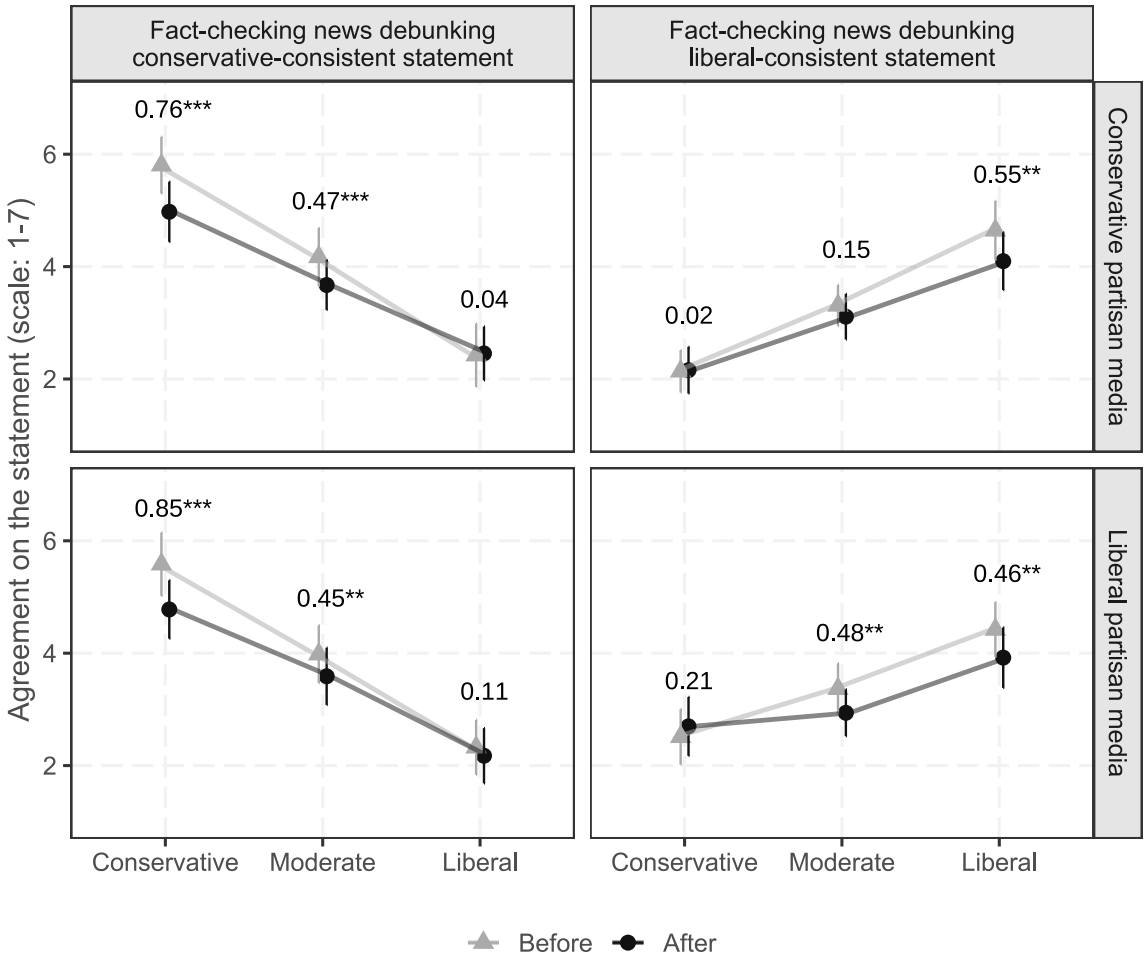
Our first hypothesis posited that the exposure to the fact-checking news would change one's belief on misinformation (i.e., agreement on the politician's statement). Regarding the effect of fact-checking news, suppose that each individual i is postulated to have two potential outcomes, $Y_i^{FC}(0)$ and $Y_i^{FC}(1)$, respectively indicating attitudes that individuals

would have when exposed to no fact-checking news vs. exposed to fact-checking news conveying correction. We define an individual-level treatment effect of fact-checking news, ${\tau_i}^{FC} = {Y_i}^{FC}(1) - {Y_i}^{FC}(0)$. It is natural to expect that the belief of i on misinformation would be diminished when the i changes his or her own view towards the direction of the given correction. Therefore, if $\tau_i^{FC} < 0$, there is a persuasive effect of fact-checking news; individual i updated his or her belief in the direction of evidence given by the fact-checking news. However, if ${\tau_i}^{FC} > 0$, it can be posited that there is a backfire effect; individual i updated his or her view to the opposite direction of evidence given by the fact-checking news. We expect that most of the ${\tau_i}^{FC}$ would have a negative value indicating overall persuasive effect. Yet as a result of the fundamental problem of causal inference (Holland, 1986; Rubin, 2005), it is impossible to directly observe ${\tau_i}^{FC}$ in the real world, therefore we instead estimate the average treatment effect (ATE), defined as $E[{\tau_i}^{FC}]$, which denotes the expected value of ${\tau_i}^{FC}$ under the stable unit treatment value assumption. For our research interest, however, it is i more desirable to consider the subgroup of subjects conditional on their treatment group and political ideology; that is, our concern is the conditional average treatment effect (CATE), $E[{\tau_i}^{FC}|D_i, X_i]$, such that D_i represents the treatment group of each individual i and X_i represents the political ideology of each individual i.

As illustrated in Figure 1, the result of paired samples two-tailed t-test shows that seven out of twelve subgroups reveals attitudinal changes towards the direction of evidence given by the fact-checking news. That is, one's belief on misinformation (i.e., the degree of agreement on the statement) decreased after the exposure to the correction in the fact-checking news in seven cases. On the contrary, there was no case of strengthening the degree of agreement on the statement even after they read the correction—hence there was no backfire effect. According to Nyhan and Reifler (2010), when the backfire effect occurs, respondents who are exposed to the fact-checking news that debunking attitude-consistent information should reinforce their prior beliefs. However, the subgroups that belong to such case (i.e., conservatives in debunking conservative-consistent condition and liberals in debunking liberal-consistent condition) rather reduced their belief after exposure to the fact-checking news.

H2 predicted directional motivated reasoning, in that the effect of fact-checking

Figure 1: Effect of fact-checking news in each experimental group



Note. Result of paired t-test (two–sided) comparing mean value of agreement on the statement of before and after exposure to the fact-checking news. The number and asterisk on the upper side of each pair indicates effect size (cohen's d) and statistical significance. Error bars mean 95% confidence interval. (** $p < .01$; *** $p < .001$)

news would be attenuated for the counter-attitudinal fact-checking news debunking pro-attitudinal statement while the effect would be greater for the pro-attitudinal fact-checking news debunking counter-attitudinal statement. As Figure 1 shows, however, subgroups exposed to the pro-attitudinal fact-checking news debunking counter-attitudinal statement (i.e., conservatives exposed to a correction debunking liberal-consistent misinformation, or liberals exposed to a correction debunking conservative-consistent misinformation) did not change the attitude after the exposure to the correction treatment. We assume that this pattern is induced by the floor effect (Shadish et al., 2002), which often

Table 2: Regression results of degree of agreement

	Liberals		Moderates		Conservatives	
	(1)	(2)	(3)	(4)	(5)	(6)
LC	**−0.58***	**−0.54***	0.30	0.29	**0.85*****	**0.85*****
	(0.23)	(0.25)	(0.23)	(0.24)	(0.21)	(0.21)
LM	−0.18	−0.13	0.11	0.11	0.02	0.08
	(0.26)	(0.27)	(0.18)	(0.19)	(0.23)	(0.23)
LC × LM	0.23	0.16	−0.34	−0.32	0.14	0.14
	(0.36)	(0.39)	(0.29)	(0.30)	(0.30)	(0.29)
Constant	0.03	−2.02	−0.50	−0.66	−0.83	−0.99
	(0.15)	(1.30)	(0.14)	(0.77)	(0.17)	(0.62)
Covariates		✓		✓		✓
R^2	0.04	0.10	0.01	0.02	0.19	0.22
Observations	142	142	218	218	171	171

Note. LC = Liberal-Consistent; LM = Liberal Media. Robust standard errors (HC2) are in parentheses. (* $p < .05$; ** $p < .01$; *** $p < .001$.)

occurs when it comes to measuring the attitude change on the polarizing topical issue (Swire-Thompson, DeGutis, et al., 2020; Taber & Lodge, 2006). This speculation is especially plausible when taking into account that there is no more room for those who are exposed to counter-attitudinal misinformation to reduce their agreement on misinformation. That is, the degree of the agreement was already too low for conservatives ($M = 2.31, SD = 1.47$) and liberals ($M = 2.47, SD = 1.54$) even before being exposed to the correction. Thus, we could not normally test **H2** predicting the evidence of directionally motivated reasoning. Readers should bear in mind that the following results on the effects of fact-checking news are also not free from this limitation.

H3 predicts that the slant of partisan media additionally moderates the effect of fact-checking news. We use ordinary least square (OLS)-based moderation models with HC2 robust standard errors, separately estimated for each of the ideology subgroup (i.e., liberals, moderates, and conservatives), which postulates a difference score of the two misinformation agreement measures as dependent variable (Allison, 1990). Specifically, we posit:

$$\left(y_i^{post} - y_i^{pre}\right) = \alpha + \beta_1(LC_i) + \beta_2(LM_i) + \beta_3(LC_i \times LM_i) + \boldsymbol{X_i\gamma} + u_i, \tag{1}$$

where ${y_i}^{pre}$ and ${y_i}^{post}$ are the degree of agreement on misinformation for respondent i before and after exposure to the fact-checking news, LC_i is a dummy variable taking value 1 if given misinformation is liberal-consistent (0 if conservative-consistent), LM_i is a dummy variable taking value 1 if the slant of media is liberal (0 if conservative), $\boldsymbol{X_i}$ is a vector including covariates of i, $\boldsymbol{\gamma}$ is a vector including coefficient of each covariate, and u_i is the error term. If the slant of partisan media affects on the effect of fact-checking news, the estimate of β_3 should show significance. However, as Table 2 shows, the slant of partisan news media does not bring any influence on the effect of fact-checking news. On the other hand, each estimate of β_1 in liberal and conservative groups (i.e., takes the significant value, which we speculate to reflects the existence of the floor effect.

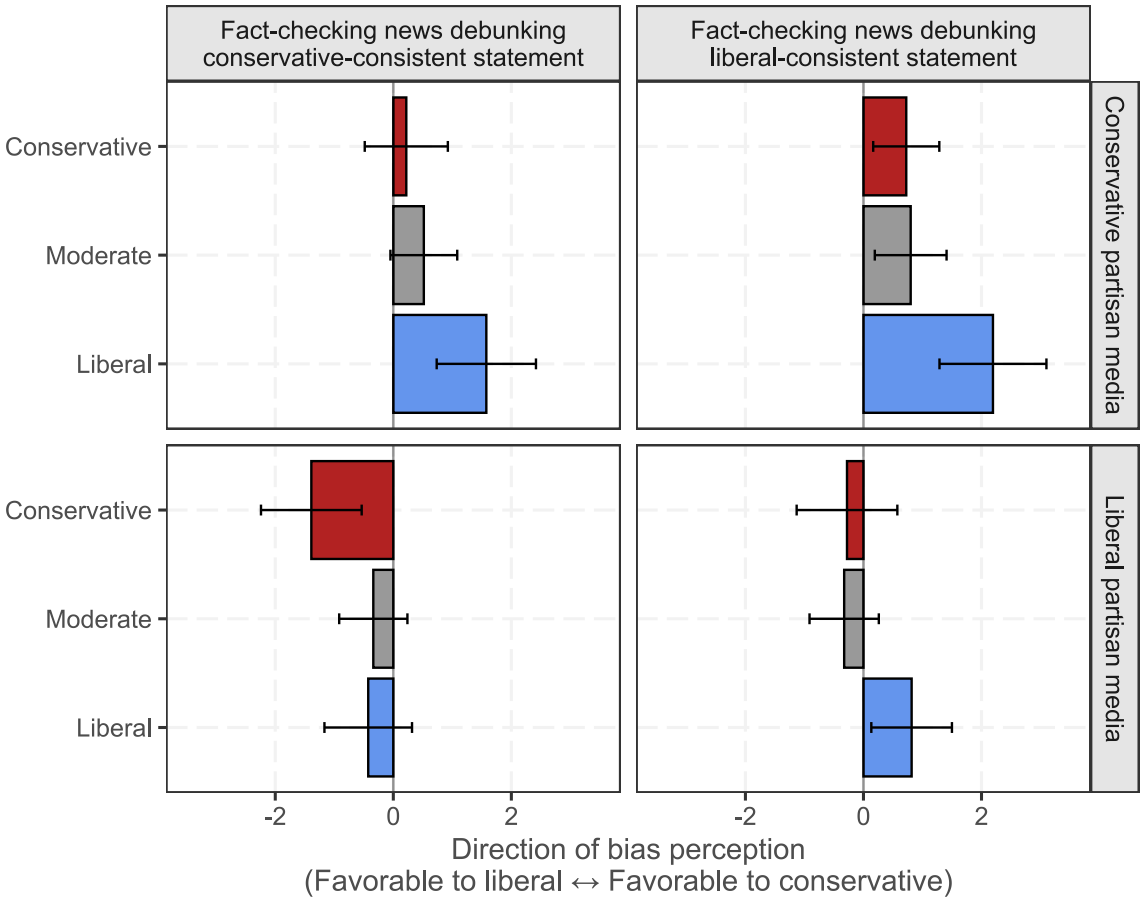
Bias Perception on Fact-Checking News

Next, we test **H4a** and **H4b**, predicting that the perception of bias would be varied by the content and source of fact-checking news respectively. We used a similar formulation as per **H1** above, defining individual-level treatment effect as $\tau_i^{Bias} = Y_i^{Bias}(1) - Y_i^{Bias}(0)$. Individual i perceives that the fact-checking news is biased favorably to conservative if $\tau_i^{Bias} > 0$, while i perceive to be biased favorably to liberal if $\tau_i^{Bias} < 0$. The ATE would be defined as $E[\tau_i^{Bias}]$, and, also in this case, our concern is CATE, $E[\tau_i^{Bias}|C_i]$ and $E[\tau_i^{Bias}|S_i]$, where C_i and S_i respectively mean content of fact-checking news individual i has been exposed to and the partisan slant of media delivering fact-checking news.

To test **H4a**, we conducted one-sample two-tailed t-test comparing with value 0 (neutral), confirming the fact-checking news delivered by conservative media was perceived significantly more favorable toward conservative, $t(268) = 6.42, p < .001, d = 0.39$, whereas the fact-checking news delivered by liberal media was significantly perceived more favorable toward liberal, $t(261) = 2.17, p = .03, d = 0.13$. As to **H4b**, the fact-checking news debunking liberal-consistent statement was perceived as biased favorably toward the conservative, $t(266) = 3.92, p < .001, d = 0.24$. However, bias perception on fact-checking news debunking conservative-consistent statement was not significant, $t(263) = 0.13, p = .90$. Figure 2, overall, illustrates the pattern of bias perception in each group by political ideology.

Then, we test **H5a** and **H5b**, predicting the relative hostile media effect of content

Figure 2: Perceived bias toward fact-checking news



Note. Direction of perceived poliltical bias depending on the political slant of partisan news media. Each bar means average bias perception of each experimental sub-group on the given fact-checking news article. Error bars represent 95% confidence intervals.

of fact-checking news and source of fact-checking news respectively. To synthetically test hypotheses, we use OLS with HC2 robust standard errors specified as the following equation:

$$\begin{aligned} y_i^{Bias} = \alpha &+ \beta_1(LC_i) + \beta_2(LM_i) + \beta_3(Lib_i) + \beta_4(Mod_i) \\ &+ \beta_5(LC_i \times Lib_i) + \beta_6(LC_i \times Mod_i) + \beta_7(LM_i \times Lib_i) + \beta_8(LM_i \times Mod_i) \\ &+ \beta_9(LC_i \times LM_i \times Lib_i) + \beta_{10}(LC_i \times LM_i \times Mod_i) \\ &+ \boldsymbol{X_i\gamma} + u_i, \end{aligned} \tag{2}$$

such that y_i^{Bias} means bias perception of respondent i on the given fact-checking news, Lib_i is dummy variable taking value 1 if the ideology of respondent i is liberal (take 0 if

Table 3: Regression results of relative hostile media effect

	Whole Samples				Only Partisans			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
LC	**0.57****	**0.56****	0.51	0.29	**0.86****	**0.82****	0.51	0.30
	(0.20)	(0.19)	(0.45)	(0.45)	(0.26)	(0.26)	(0.45)	(0.46)
LM	**−1.27*****	**−1.28*****	**−1.61****	**−1.99*****	**−1.47*****	**−1.54*****	**−1.61****	**−1.99*****
	(0.20)	(0.20)	(0.55)	(0.57)	(0.27)	(0.26)	(0.55)	(0.58)
Lib	**1.18*****	**1.09*****	**1.36***	1.00	**1.22*****	**1.13*****	**1.36***	0.98
	(0.27)	(0.27)	(0.54)	(0.54)	(0.27)	(0.27)	(0.54)	(0.53)
Mod	0.34	0.43	0.30	0.06				
	(0.23)	(0.23)	(0.45)	(0.46)				
Constant	0.18	−0.79	0.22	−0.62	0.11	−0.03	0.22	0.23
	(0.22)	(0.82)	(0.35)	(0.86)	(0.25)	(1.07)	(0.35)	(1.09)
Interaction			✓	✓			✓	✓
Covariates		✓		✓		✓		✓
R^2	0.11	0.15	0.12	0.17	0.16	0.21	0.16	0.21
Observations	531	531	531	531	313	313	313	313

Note. LC = Liberal-Consistent; LM = Liberal Media; Lib = Liberal; Mod = Moderate. None of the interaction term is statistically significant. Robust standard errors (HC2) are in parentheses. (* $p < .05$; ** $p < .01$; *** $p < .001$.)

conservative), and Mod_i is dummy variable taking value 1 if the ideology of respondent i is moderate (take 0 if conservative).[4] As can be seen in Table 3, OLS models indicate that the bias perception of fact-checking news also shows the pattern of relative hostile media effect, supporting the hypotheses. Respondents, overall, perceived that fact-checking news debunking liberal-consistent information as more favorable to conservative than the fact-checking news debunking conservative-consistent information. However, the effects of content valence on bias perception were qualified when interaction terms were added. In addition, fact-checking news by liberal media was perceived as more favorable to liberals compared to fact-checking news by conservative media. Furthermore, liberals perceived given fact-checking news as relatively favorable toward conservatives (i.e., outgroup). Notably, we confirm that the effect of the source is always stronger than the effect of content in every model in Table 3. The findings are consistent regarding the inclusion of covariates, and type of samples (whole samples vs. only partisans), while only the inclusion of interaction terms attenuate the effect of content valence on bias perception.

Lastly, we test **H6**, positing the intensity of bias perception would increase as ideolog-

[4]Other notations are all equivalent to the ones of eq. (1).

Table 4: Regression results of intensity of bias perception

	Intensity of bias perception		
	(1)	(2)	(3)
Weak	0.02	0.02	0.02
	(0.03)	(0.03)	(0.03)
Strong	**0.15*****	**0.15*****	**0.12****
	(0.04)	(0.04)	(0.04)
LC		0.04	0.04
		(0.04)	(0.04)
LM		0.03	0.02
		(0.04)	(0.04)
LC × LM		−0.06	−0.05
		(0.06)	(0.06)
Constant	0.31	0.29	0.37
	(0.02)	(0.03)	(0.12)
Covariates			✓
R^2	0.03	0.04	0.09
Observations	531	531	531

Note. LC = Liberal-Consistent; LM = Liberal Media. Robust standard errors (HC2) are in parentheses. (* $p < .05$; ** $p < .01$; *** $p < .001$.)

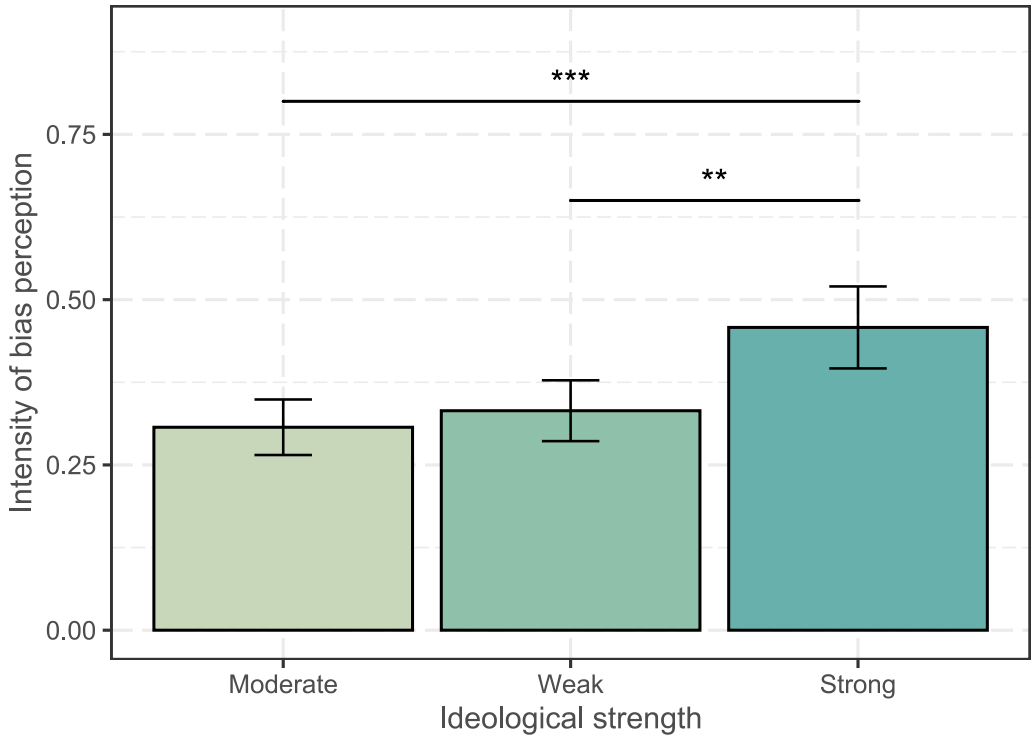
ical strength increases. Following OLS with HC2 robust standard errors was used to test the hypothesis:

$$y_i^{Intensity} = \alpha + \beta_1(Weak_i) + \beta_2(Strong_i) + \beta_3(LC_i) + \beta_4(LM_i) + \beta_5(LC_i \times LM_i) + \boldsymbol{X_i\gamma} + u_i, \quad (3)$$

where $y_i^{Intensity}$ is the intensity of bias perception of each individual i, $Weak_i$ is dummy variable taking value 1 if individual i is weak ideologue (take 0 if i is moderate), and $Strong_i$ is dummy variable taking value 1 if i is strong ideologue (take 0 if i is moderate).[5] As can be seen in Table 4, strong ideologues perceived bias on fact-checking news more intensively than moderates ($b = .15, SE = .04, p < .001$). To scrutinize the pattern in detail, we compared each mean intensity of bias perception with Bonferroni-corrected alpha level (i.e., $\alpha = 0.05/3$). As a result, we confirm that the intensity of the bias perception of strong ideologue ($M = .46, SD = .35$) was significantly stronger than that of weak ideologue ($M = .33, SD = .32$) and moderate ($M = .31, SD = .32$; see Figure 3).

[5]Other notations are all equivalent to the ones of eq. (1).

Figure 3: Intensity of bias perception by ideological strength



Note. Mean comparisons with Bonferroni adjusted p-value on the intensity of perceived bias with increase of ideological strength. Error bars represent 95% confidence intervals. (** $p_{adj} < .01$; *** $p_{adj} < .001$)

Discussion

This study examined the effect of fact-checking news delivered by partisan media and the bias perception of the fact-checking news content. We used the original experiment performed in South Korea where established partisan news organizations are actively conducting fact-checking news reports. In our experiment, respondents were randomly exposed to a statement of politician containing conservative-consistent or liberal-consistent misinformation, and prompted how much do they agree with the given statement. Then, this misinformation was corrected with fact-checking news being produced by either conservative or liberal news media. After that, respondents were again asked to rate the degree of agreement on the statement and in which direction do they perceive the given fact-checking news is favorable to.

In regards to the attitudinal change induced by the fact-checking news, the pattern we confirmed here was more likely in line with the results supporting the persuasive effect

(De Benedictis-Kessner et al., 2019; Guess & Coppock, 2018; Wood & Porter, 2019) rather than the backfire effect (Nyhan & Reifler, 2010). Although the correction was conveyed by partisan media, a respondent's degree of agreement towards misinformation overall decreased as a result of the exposure to the fact-checking news. Whether the slant of such fact-checking news was geared towards conservative or liberal was indeed not influential to the effect of fact-checking news. However, bias perception on the fact-checking news was varied both by the slant of news media and content of the given correction, revealing a similar pattern with Gunther et al. (2017). Notably, the effect size of the source (i.e., the slant of news media) was always larger than the effect size of the content valence of correction in every model. Furthermore, the intensity of bias perception increased as the ideological strength increased, which is in line with the prior works concerning bias perception on ordinary news articles or statements (Reid, 2012; Turner, 2007). After all, a remarkably intriguing observation of our research is that the ones who were exposed to counter-attitudinal content by outgroup partisan media (i.e., conservatives in conservative-consistent × liberal media condition and liberals in liberal-consistent × conservative media condition; see Figure 2) perceived the given fact-checking news as biased favorably toward outgroup while showing the persuasive effect (see Figure 1).

The media environment of our research is unique in the sense that the partisan media is playing a leading role in fact-checking. Yet the increasing tendency of established news organizations to take part in producing fact-checking intervention suggests notable implications of our findings, while further expanding the applicability of theories advanced by previous research on misinformation and media bias. At the same time, our findings also suggest that people likely perceive political bias on the fact-checking news but nevertheless change their attitudes in accordance with the given fact-checking news; thereby it suggests that citizens indeed can adhere factual information based on correction messages despite their perpetual partisan biases, echoing several prior works on this topic (e.g., Nyhan et al., 2020; Wood & Porter, 2019). While we cannot definitely identify and confirm the precise nature of such mechanisms, it may further suggest that changes in one's agreement or belief on misinformation not necessarily require corresponding changes in bias perception of the fact-checking news, suggesting the possibility

of "attitudinal persuasion with perceptual backfire."

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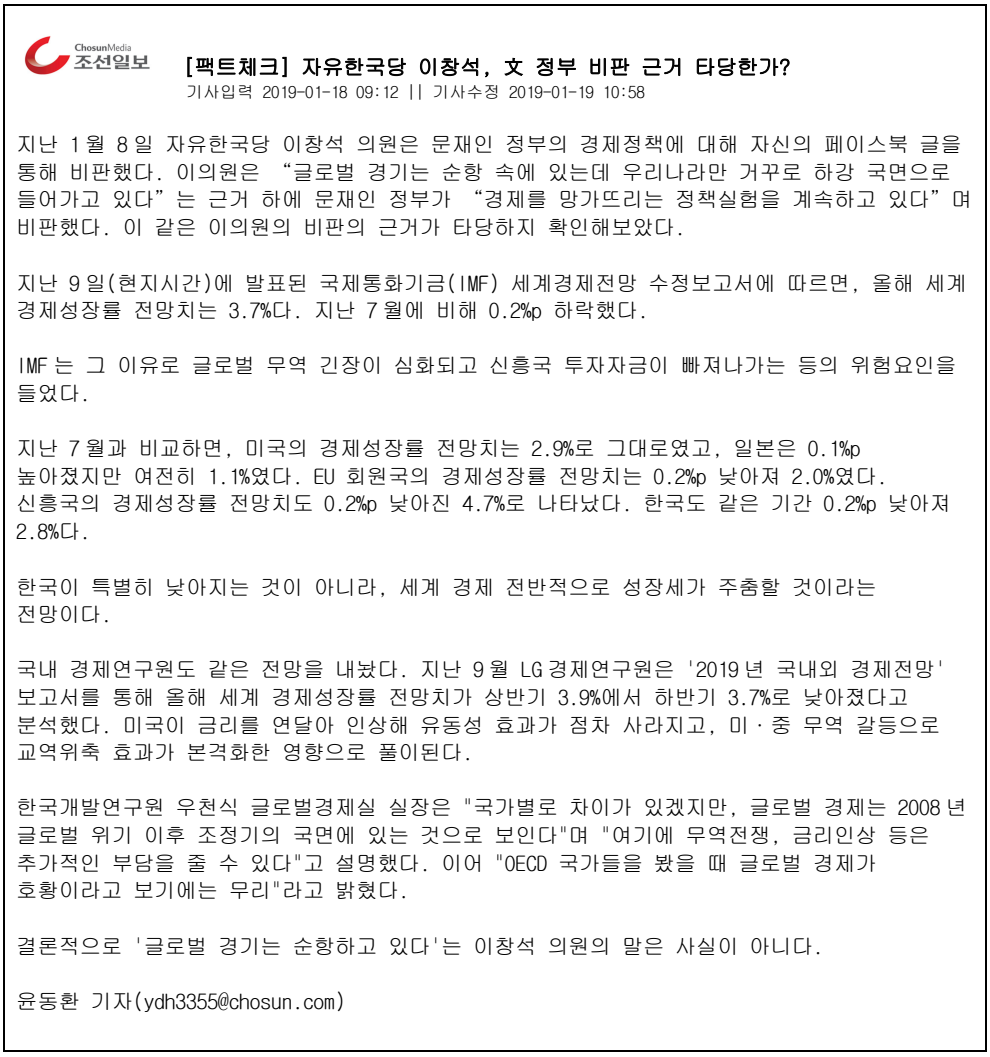
A Treatment Materials

Figure A.1: Conservative-consistent × Conservative media



조선일보

[팩트체크] 자유한국당 이창석, 文 정부 비판 근거 타당한가?

기사입력 2019-01-18 09:12 || 기사수정 2019-01-19 10:58

지난 1월 8일 자유한국당 이창석 의원은 문재인 정부의 경제정책에 대해 자신의 페이스북 글을 통해 비판했다. 이의원은 “글로벌 경기는 순항 속에 있는데 우리나라만 거꾸로 하강 국면으로 들어가고 있다”는 근거 하에 문재인 정부가 “경제를 망가뜨리는 정책실험을 계속하고 있다”며 비판했다. 이 같은 이의원의 비판의 근거가 타당하지 확인해보았다.

지난 9일(현지시간)에 발표된 국제통화기금(IMF) 세계경제전망 수정보고서에 따르면, 올해 세계 경제성장률 전망치는 3.7%다. 지난 7월에 비해 0.2%p 하락했다.

IMF는 그 이유로 글로벌 무역 긴장이 심화되고 신흥국 투자자금이 빠져나가는 등의 위험요인을 들었다.

지난 7월과 비교하면, 미국의 경제성장률 전망치는 2.9%로 그대로였고, 일본은 0.1%p 높아졌지만 여전히 1.1%였다. EU 회원국의 경제성장률 전망치는 0.2%p 낮아져 2.0%였다. 신흥국의 경제성장률 전망치도 0.2%p 낮아진 4.7%로 나타났다. 한국도 같은 기간 0.2%p 낮아져 2.8%다.

한국이 특별히 낮아지는 것이 아니라, 세계 경제 전반적으로 성장세가 주춤할 것이라는 전망이다.

국내 경제연구원도 같은 전망을 내놨다. 지난 9월 LG경제연구원은 '2019년 국내외 경제전망' 보고서를 통해 올해 세계 경제성장률 전망치가 상반기 3.9%에서 하반기 3.7%로 낮아졌다고 분석했다. 미국이 금리를 연달아 인상해 유동성 효과가 점차 사라지고, 미·중 무역 갈등으로 교역위축 효과가 본격화한 영향으로 풀이된다.

한국개발연구원 우천식 글로벌경제실 실장은 "국가별로 차이가 있겠지만, 글로벌 경제는 2008년 글로벌 위기 이후 조정기의 국면에 있는 것으로 보인다"며 "여기에 무역전쟁, 금리인상 등은 추가적인 부담을 줄 수 있다"고 설명했다. 이어 "OECD 국가들을 봤을 때 글로벌 경제가 호황이라고 보기에는 무리"라고 밝혔다.

결론적으로 '글로벌 경기는 순항하고 있다'는 이창석 의원의 말은 사실이 아니다.

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Figure A.2: Conservative-consistent × Liberal media

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[팩트체크] 자유한국당 이창석, 文 정부 비판 근거 타당한가?

기사입력 2019-01-18 09:12 || 기사수정 2019-01-19 10:58

지난 1월 8일 자유한국당 이창석 의원은 문재인 정부의 경제정책에 대해 자신의 페이스북 글을 통해 비판했다. 이의원은 “글로벌 경기는 순항 속에 있는데 우리나라만 거꾸로 하강 국면으로 들어가고 있다”는 근거 하에 문재인 정부가 “경제를 망가뜨리는 정책실험을 계속하고 있다”며 비판했다. 이 같은 이의원의 비판의 근거가 타당하지 확인해보았다.

지난 9일(현지시간)에 발표된 국제통화기금(IMF) 세계경제전망 수정보고서에 따르면, 올해 세계 경제성장률 전망치는 3.7%다. 지난 7월에 비해 0.2%p 하락했다.

IMF는 그 이유로 글로벌 무역 긴장이 심화되고 신흥국 투자자금이 빠져나가는 등의 위험요인을 들었다.

지난 7월과 비교하면, 미국의 경제성장률 전망치는 2.9%로 그대로였고, 일본은 0.1%p 높아졌지만 여전히 1.1%였다. EU 회원국의 경제성장률 전망치는 0.2%p 낮아져 2.0%였다. 신흥국의 경제성장률 전망치도 0.2%p 낮아진 4.7%로 나타났다. 한국도 같은 기간 0.2%p 낮아져 2.8%다.

한국이 특별히 낮아지는 것이 아니라, 세계 경제 전반적으로 성장세가 주춤할 것이라는 전망이다.

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Figure A.3: Liberal-consistent × Conservative media

조선일보

[팩트체크] 한국 고성장?… OECD 18위로 1996년 이후 최저 순위

기사입력 2019-01-18 09:12 || 기사수정 2019-01-19 10:58

더불어민주당 이창석 의원이 지난 1월 8일 문재인 정부의 지난 2년간 경제 정책을 평가한 발언이 논란이다.

그는 지금까지의 경제 상황이 좋다고만은 할 수 없으나 앞으로의 상황까지 부정적으로 볼 필요는 없다고 주장하며, G20 국가나 OECD 국가중 한국은 상당히 고성장이라는 근거를 제시했다.

이 발언과 관련해 정부에 유리한 수치와 통계만 인용하고, 그 반대 자료는 무시해 보고싶은 것만 본다는 지적이 일고 있다.

이에 해당 근거에 대한 사실관계를 확인해보았다.

이의원의 발언은 지난해 '30-50 클럽(소득 3만 달러, 인구 5000만 명 이상)' 7개국(미국, 일본, 독일 등) 가운데 한국의 경제성장률이 미국 다음으로 높았다는 점에 근거한다.

하지만 OECD 36개 회원국 가운데 우리나라의 성장률 순위는 18위에 그쳤다. OECD 성장률 18위는 우리나라가 OECD에 가입한 1996년 이후 가장 낮은 순위(외환위기 때 제외)다.

아울러 이의원은 최저임금 인상과 소득주도성장의 효과를 설명하며 "저소득 노동자 비중이 역대 최고로 낮아졌다"고 말했다.

그러나 최저임금 인상 부작용 등으로 저소득층의 실제 소득이 떨어진 것은 언급하지 않았다.

통계청에 따르면 소득 1분위(하위 20%) 소득은 지난해 1분기(전년 대비, -8.0%), 2분기(-7.6%), 3분기(-7.0%), 4분기(-17.7%) 등으로 악화했다.

결론적으로 이창석 의원이 제시한 근거는 사실이 아니다.

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Figure A.4: Liberal-consistent × Liberal media

한겨레 hani.co.kr

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B Mean Comparison in each sub-group

Table B.1: Mean comparison in each sub-group

		Before		After				
	n	*M*	*SD*	*M*	*SD*	*t*	*p*	Cohen's *d*
Liberal-consistent × Conservative Media								
Liberal	33	2.42	1.58	2.45	1.35	0.21	.839	0.02
Moderate	58	4.17	1.96	3.67	1.68	-3.58	< .001	0.27
Conservative	41	5.80	1.60	4.98	1.70	-4.86	< .001	0.50
Liberal-consistent × Liberal Media								
Liberal	40	2.33	1.53	2.17	1.53	-0.69	.492	0.10
Moderate	56	3.98	1.92	3.59	1.90	-3.39	< .001	0.21
Conservative	36	5.58	1.66	4.78	1.53	-5.08	< .001	0.50
Conservative-consistent × Conservative Media								
Liberal	31	4.65	1.43	4.10	1.40	-3.07	.005	0.39
Moderate	55	3.31	1.35	3.11	1.50	-1.09	.282	0.14
Conservative	51	2.14	1.34	2.16	1.47	0.17	.868	0.01
Conservative-consistent × Liberal Media								
Liberal	38	4.42	1.48	3.92	1.63	-2.84	.007	0.32
Moderate	49	3.37	1.58	2.94	1.45	-3.37	< .001	0.28
Conservative	43	2.51	1.61	2.70	1.70	1.35	.186	0.11