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Debunking fake ad claims: the moderating role of gender

Somak Banerjee^a, Joseph F. Rocereto^b, Hyokjin Kwak^c and Arpita Pandey^d

^aCollege of Business and Economics, California State University, Los Angeles, CA, USA; ^bLeon Hess Business School, Monmouth University, West Long Branch, NJ, USA; ^cIndian Institute of Management Ahmedabad, Ahmedabad, Gujarat, India; ^dIndian Institute of Management Bangalore, Bangalore, Karnataka, India

ABSTRACT

Countering ads with fake claims represent a significant challenge for marketers and policymakers. We show how gender can help better target debunking efforts toward fake ads. First, we find that females (vs. males) show higher sensitivity to debunking efforts toward fake ads, leading to less favorable attitudes toward the brand and, consequently, lower purchase intentions. We then further probe these effects by introducing processing variables from the tenets of perceived risk (perceived health risk) and information processing confidence (skepticism toward the ad). We find that debunking information induces higher levels of skepticism among females owing to their lower information processing confidence than males, leading to downstream effects of higher perceptions of health risk, less favorable attitudes toward the brand, and lower purchase intentions among females than males. Our findings provide implications for advertisers and policymakers to battle the ongoing proliferation of fake ads.



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fake ads; debunking; gender; information processing; ad skepticism

The spread of fake information possesses a challenge for marketers and policymakers. Delivering misinformation about products threatens genuine products, as a surge in sales of products sold using misinformation can lead to reduced consumer trust in other brands (Nyilasy 2019, Lafraniere and Hamby 2020, Grigsby 2020). Existing work on the efficacy of countering misinformation has focused chiefly on misleading and fake news (Pennycook et al. 2020, van Der Linden, Roozenbeek, and Compton 2020, Domenico and Visentin 2020, etc.). To date, there is scant research that has investigated the efficacy of any countering efforts to address fake information in the context of fake advertisements, i.e. ads that deliberately use fake claims (by the seller) about the product's efficacy (Chiou and Tucker 2018, Kang et al. 2016). Furthermore, most previous research has focused on tackling misinformation before it has already spread. For example, van Der Linden, Roozenbeek, and Compton (2020) propose active inoculation of individuals against misinformation by providing prior exposure to similar

CONTACT Hyokjin Kwak  hkwak@iima.ac.in  Indian Institute of Management Ahmedabad, B14 New Faculty Block Heritage Campus, Ahmedabad, Gujarat, India 380015

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manipulation techniques that are commonly employed by fake news articles to manipulate readers (e.g. emotional language, conspiratorial reasoning, or impersonating experts) in an effort to mitigate the effects of consumers' believing and spreading of fake news.

While the inoculation method has definite merits, as suggested by the literature, its effectiveness is based on the assumption that consumers lack prior exposure to the misinformation that is being spread (Lewandowsky et al. 2020). However, very frequently, policymakers and advertisers only come to know about the spreading of such fake ads when consumers report about them after they have been deceived by trusting the misinformation (Lewandowsky et al. 2020). Hence, by the time policymakers begin to take action to curb the spread of misinformation, there is a good chance that consumers have already been exposed to it. Thus, inoculation will not be very effective in mitigating the effects of misinformation in the case of fake ads since policymakers generally only find out about them after consumers have been exposed to them.

However, debunking, another method to mitigate the effects of misinformation, has been shown to be effective in curbing the spread of misinformation in cases where misinformation has already spread (Lewandowsky et al. 2020). In this context, debunking is defined as 'presenting a corrective message that establishes that the prior message was misinformation' (Chan et al. 2017, 1532). Research in debunking information shows that informing consumers via a reliable source that an ad contains misleading information can deter consumers from purchasing the product and create negative attitudes toward the brand (Darke, Ashworth, and Ritchie 2008). Also, consumers generally show a lower likelihood of purchasing the product based on future ads from the same brand. Furthermore, these negative attitudes seem to persist and affect consumers' responses toward future ads in general (Darke, Ashworth, and Ritchie 2008). However, past research has not tested the efficacy of the debunking method in mitigating the effects of the spread of misinformation in the context of fake advertisements. Since both fake news and fake advertisements are employed to mislead and deceive consumers, we believe that the current pool of research on the efficacy of countering fake news will also be applicable in the context of debunking misleading claims made by fake ads.

Here, we investigate the effects of gender on efforts to debunk fake ads. Prior research has demonstrated that when confronted with misinformation, men and women react differently. For instance, research has shown that females are more likely to identify misinformation (Schmidt et al. 2021), are generally less likely to believe conspiracy theories (Cassese, Farhart, and Miller 2020), and are more concerned with the malign effects of misinformation on society (Almenar et al. 2021) than men. Furthermore, research demonstrates that women are better at identifying and are less likely to spread fake information than men (Li, Zhang, and Wang 2017). Therefore, based on the differential manner in which men and women process misinformation, we believe that investigating the role of gender in efforts to debunk fake ads will provide important new theoretical and managerial insights in the ongoing efforts to minimize the negative effects of the spread of misinformation.

To test our proposed conceptual model, in Study 1, we begin by examining how gender moderates the effect of a debunking effort (i.e. a news article from a reputable

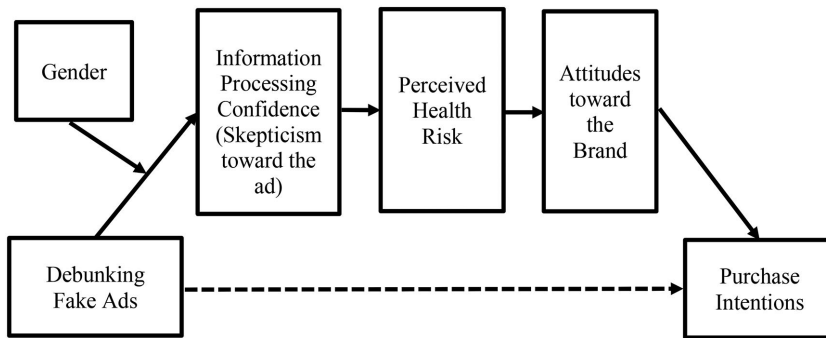


Figure 1. Overall conceptual model.

newspaper) for a fake ad on consumers' attitudes toward the brand and, consequently, on consumer's intentions to purchase the product. In Study 2, we further explore the effect of gender by introducing perceived health risk as a potential mediator that explains the differential effects of debunking fake ads between gender on attitudes toward the brand and, consequently, purchase intentions. In Study 3, we explore a more nuanced approach to explain the differential effects observed across gender in the previous studies. We show that when provided with debunking information regarding the claims in a fake ad, females exhibit higher skepticism levels than their male counterparts. This difference in skepticism drives the consequent differences in perceptions of health risks, attitudes toward the brand, and intentions to purchase the brand. Thus, we show that the selective targeting of females with debunking efforts can help policymakers make their debunking efforts more effective. Overall, our work contributes to both theory and practice by 1) demonstrating the effects of debunking fake ads on purchase intentions via attitudes toward the brand; 2) investigating the role of gender and perceived health risk in shaping consumer perceptions in response to efforts to debunk fake ads; and 3) establishing a previously unexplored, more nuanced, link between information processing confidence and gender, that explains the effects of debunking efforts of fake ads. Furthermore, our insights into effectively countering the negative effects of fake ads through a news article by targeting female customers is relevant for public policy professionals attempting to counter advertising fraud. We begin by providing a review of the relevant literature, followed by the conceptualization and hypothesis development for our research. Overall, three studies are presented in this paper to provide important theoretical and managerial contributions to the misinformation and fake ads literature. Our conceptual model is presented in Figure 1.

Debunking fake ads and its impact on purchase intentions

Xiao and Benbasat (2011, 172) define fake or deceptive information as 'the deliberate manipulation of product-related information perpetrated by online merchants to mislead consumers in order to induce desired attitudinal and behavioral changes in consumers—changes that are detrimental to consumers and beneficial to the merchants'. According to Xiao and Benbasat (2011), misleading information can be created

either through concealment (e.g. withholding negative safety information), equivocation (e.g. providing vague information about the total price, delivery timelines, etc.), or falsification (e.g. generating false reviews or making unverified claims). In this paper, we focus specifically on the context of false claims (i.e. the 'falsification') and on efforts that can be effective in debunking misleading or false claims made in ads.

Research from psychology indicates that people are prone to accepting information or claims as true on the face of it (Shavitt, Lowrey, and Haefner 1998). The elaboration likelihood model suggests that consumers would believe misleading claims if they lack the motivation to engage in effortful thinking about the core contents of the claim (Petty and Cacioppo 1986). Rejecting or disbelieving claims would require a high degree of attention, high implausibility in the message, or high levels of distrust at the time the claim is received (Lewandowsky et al. 2012). If consumers do not detect the advertisers' intention to mislead, it can lead to positive attitudes and increased purchase intentions toward the brand and product that would not have existed in the absence of such deception (Xiao and Benbasat 2011).

In contrast, consumers would perceive deception if their preconceived expectations with regard to the product or brand are negatively violated (Xiao and Benbasat 2011). Equity theory suggests that consumers evaluate transactions in terms of whether each party has contributed fairly to the transaction. Perception of deception will lead to perceptions of unfairness, in which case, consumers will view the transaction as inequitable, leading to negative impacts on attitudes and purchase intentions toward products and brands (Ingram, Skinner, and Taylor 2005). In similar findings, Fu et al. (2019) show that an awareness of price deception in products leads to reduced intentions to purchase.

Debunking misleading claims made in an ad can trigger heightened consumer perceptions of deception. In this context, debunking is defined as 'presenting a corrective message that establishes that the prior message was misinformation' (Chan et al. 2017, 1532). Darke, Ashworth, and Ritchie (2008) find that providing consumers with knowledge that an ad contains misleading information leads to negative attitudes toward the brand. They also find that the negative attitudes extend to future ads, with a lower purchase likelihood for products in future ads from the same and other brands. Darke, Ashworth, and Main (2010) show that providing consumers with information that actual product performance was inferior as compared to the claims made in an ad generates distrust that is carried over to other products advertised by the brand. These findings are relevant, as consumers can react negatively if informed about misleading claims regarding fake ads.

Building on this evidence, we investigate the effects of debunking misleading claims made in ads and hypothesize that providing debunking information will lead to more negative consumer attitudes toward the brand in the ad. Furthermore, prior research has established that consumer attitudes influence purchase intentions (Wu and Lo 2009, Teng 2009). Therefore, providing debunking information could also have negative implications for purchase intentions toward the product and brand. Overall, we hypothesize that:

H1: The negative impact of the presence (vs. absence) of debunking information regarding fake claims in an ad on purchase intentions will (will not) be mediated by attitudes toward the brand.

Role of gender as a moderator in debunking fake ad claims

Work by Cassese, Farhart, and Miller (2020) shows that males and females react differently, with females less likely to believe conspiracy theories as compared to males. Females show greater sensitivity to the particulars of relevant information in ads (Darley and Smith 1995) and are more sensitive to stimulus or task factors that influence ad processing (Lenney, Gold, and Browning 1983) compared to males. Furthermore, Chang (2007) shows that females are more likely to consider the manipulative intentions of advertisers (e.g. ad claims) as compared to males, leading to negative ad and brand evaluations. Thus, we can assume that females would be more critical of an ad than males when exposed to information that debunks the claims made in ads.

Furthermore, the selectivity model indicates that males use heuristics to process ads, while females use detailed processing (Meyers-Levy and Sternthal 1991, Meyers-Levy and Maheswaran 1991, Meyers-Levy 1986). Females use all available information in ads to make judgments and are more critical (Román 2010) and sensitive to incomplete information, while males rely only on the available information (Kempf, Laczniak, and Smith 2006). Recent research also shows that males are more likely to show 'mere exposure effects' and have favorable attitudes toward ads with little attention as compared to females (Goodrich 2014, Rahmani and Kordrostami 2017). Thus, in the case of fake ads, after exposure to the debunking claim, females will be more critical in evaluating the ad and, hence, will have less favorable attitudes toward the ad compared to males. Therefore, we can conclude that the less favorable ad attitudes in females toward the fake ad (when the debunking claim is presented after showing the ad) will lead to more negative views of brand evaluation than males. This more negative level of brand evaluation should lead to lower levels of purchase intentions.

Thus, we hypothesize:

H2: The mediation between debunking information regarding fake claims in an ad on purchase intentions will be moderated by gender, such that females (vs. males) will exhibit less favorable attitudes toward the brand.

Study 1

In Study 1, we start by investigating if attitudes toward the brand mediate the impact of debunking the information presented in the fake ads on consumers' purchase intentions. Then, we explore whether this mediation effect is moderated by gender. Further, using within-subject measurements, we also test for differences across gender in purchase intentions and attitudes toward the brand before and after subjects are exposed to the debunking article (WSJ article), informing them that the information presented in the ad was fake.

Design and sample

190 general consumers from Amazon Mechanical Turk (MTurk) (at least 18 years old; 47.9% female) participated in the study and were compensated monetarily. The subjects were randomly assigned to one of two conditions (debunking fake ads: debunked fake ad vs. non-debunked fake ad). For the debunked fake ad condition, the participants were presented with an ad for a product, followed by information that described

the advertisement as being fake, thereby debunking the information presented in the ad. For the non-debunked fake ad condition, participants were presented with the same ad but were not made aware that the ad included fake information. A link to the survey was provided, and participants who volunteered to complete the survey were compensated monetarily. At the end of the questionnaire, participants were asked to state their gender, which served as the other between-subjects factor.

Manipulations and procedures

We used the context of COVID-19 for creating the ads for the stimuli owing to the recent proliferation of COVID-19 related fake information. In less than a period of two years, consumers in the USA have filed 244,708 complaints after losing USD 466.6 million to fraud during COVID-19 (Federal Trade Commission 2020a). Also, since March 2020, The United States Food and Drug Administration (USFDA) has issued 219 warning letters to sellers promoting products with misleading claims to prevent, treat, mitigate, diagnose, or cure COVID-19 (U.S. Food and Drug Administration 2022). The stimuli for the study were created by drawing on literature on deception in ads and misinformation communication (Braun-LaTour et al. 2004; LaTour and LaTour 2009; Cappella and Jamieson 1994). For the fake ad condition, the ad for a fictitious brand containing misinformation regarding the product's benefits specific to COVID-19 was created. We created a stimulus that reflects a real-life ad as closely as possible. In order to do this, we consulted a list of fake and misleading COVID-19 products released by the Federal Trade Commission (FTC) and the U.S. Food and Drug Administration (FDA). We focused on the products that were advertised in the United States since the beginning of COVID-19 (November 2019 – October 2022) and created a repository. The final products selected were real-life products that were advertised and sold in The United States and listed on the FDA and FTC websites as containing fake claims. We selected ads for a COVID-19 home testing kit for this study. An ad for a fictitious brand, 'CovWatch', that sold COVID-19 home testing kits was created using data from our repository. The ad claimed that CovWatch's home testing kit could be used to test oneself for COVID-19 at home. For the debunked fake ad condition, in order to expose the fact that the ad contained deceptive claims about the product, we created a news article that debunked the ad claims. Research shows that there are two primary ways in which individuals recognize that an ad or news is fake: news articles from reliable media sources and fact-checking websites (Shu et al. 2017). Of these, because of their reach and popularity, news articles have been traditionally considered more acceptable by consumers (Shu et al. 2017). Thus, in this research, we utilize a news article to debunk the ad claims in the fake ad condition. For this, we reviewed various news articles that appeared in media sources debunking fake ads, fake products, and misinformation. Utilizing these, we created a Wall Street Journal (WSJ) article that dismissed the claims in the ad as spurious. The text of the WSJ refuting the ad stated, 'Latest to join this bandwagon is the concern regarding the ads for coronavirus home testing kits by CovWatch. The CovWatch ads claim that the consumers can self-test themselves at home without going to a COVID-19 medical test center. However, according to FDA, such claims are unsubstantiated. Moreover, FDA, has not approved any commercial tests that are available for the public and warned consumers to be wary of unauthorized COVID-19 test kits.'

At the beginning of the study, all participants were informed that they would be taking part in a study investigating ad perceptions. Participants in both conditions viewed the identical ad for the COVID-19 test kits. However, participants in the debunked fake ad group were then presented with the WSJ article debunking the claims in the ad. The survey was set in such a way that the respondents would need to spend at least 20 seconds on the WSJ article before responding to the post-WSJ article measures in the case of the debunked fake ad condition. Thus, there was at least a twenty-second gap between completing the pre-WSJ article measures and responding to the post-WSJ article measures in the debunking condition. Figure 2 shows the stimuli for the two experimental conditions.

CovWatch

COVID-19 TESTING & CONSULTATIONS

Are you worried that you have been exposed to COVID-19?

Use our CovWatch COVID-19 home test kit to test yourself without stepping out of your house.

www.CovWatch.com

Facebook, Instagram, Twitter icons

The advertisement shows a hand holding a cardboard box labeled 'Your COVID-19 Home Test Kit' with the CovWatch logo and website URL.

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Fake Ad Claims About COVID-19 Products

By Michael Cooper
Updated November 2, 2020 8:00 pm ET

Despite clarifications by health watch guards such as WHO, CDC, misinformation surrounding COVID-19 continues unabated. FDA and media outlets have vowed to fight false information about products and services related to the coronavirus epidemic. However, various fraudulent advertisements, posts, listings and commercial information are still pervasive both online and offline.

Latest to join this bandwagon is the concern regarding the ads for coronavirus home testing kits by CovWatch. The CovWatch ads claim that the consumers can self-test themselves at home without going to a COVID-19 medical test center. However, according to FDA such claims are unsubstantiated. Moreover, FDA has not approved any commercial tests that are available for public and warned consumers to be wary of unauthorized COVID-19 test kits.

Figure 2. Manipulation of ads and debunking article in Study 1.

Measures

All participants were exposed to the CovWatch's home testing kits ad and asked to indicate their intentions to purchase the product and attitudes toward the brand. A three-item, seven-point scale (unlikely/likely, improbable/probable, uncertain/certain) was used to measure the participants' intentions to purchase the advertised product (Bearden, Lichtenstein, and Teel 1984). Attitudes toward the brand was measured using a three-item, seven-point Likert scale (1 = *strongly disagree*; 7 = *strongly agree*) ('I think CovWatch is a very good brand'/'I think CovWatch is a very useful brand'/'My opinion of CovWatch is very favorable') (Sengupta and Johar 2002). For the debunked fake ad condition in which the participants were later presented with the debunking information, these measures served as pre-treatment responses of the participants. The participants in the debunked fake ad condition were then presented with the WSJ debunking article and responded to the same questions pertaining to purchase intentions ($\alpha=0.93$) and attitudes toward the brand ($\alpha=0.97$) again. Finally, data regarding gender, age, and ethnicity were collected with single-item measures in the questionnaire.

Results

Manipulation check. As a manipulation check, participants in the debunked fake ad condition (ad claim debunked) were asked, 'According to the Wall Street Journal article that you read, the ad for CovWatch's COVID-19 home testing kit was fake' (Y/N). The manipulation check results showed a significant difference between the 'yes' (83.9%) and 'no' responses ($\chi^2(1) = 42.67, p < 0.01$), indicating that the manipulation was successful.

Empirical findings. The results supported the mediation hypothesis, H1. To test whether attitudes toward the brand mediated the effect of debunking the fake ad on purchase intentions, we conducted a series of bootstrap mediation analyses utilizing model 4 (Hayes 2017). The predictor was debunking fake ads (debunked fake ad (ad claims debunked = 1), non-debunked fake ad (ad claims not debunked = 0), the mediator was attitudes toward the brand, and the criterion was purchase intentions. The overall model was significant ($F(2,187) = 290.44, p < .01$). The indirect effect (fake ads \rightarrow attitudes toward the brand \rightarrow purchase intentions) of fake ads on purchase intentions via attitudes toward the brand was significant ($B = -1.16, 95\% CI = -1.64$ to -0.66). Moreover, the direct effect was not significant, $p > 0.1$, indicating that attitudes toward the brand fully mediated the effect of debunking the fake ad on purchase intentions.

Next, to corroborate our moderated mediation hypothesis (H2), we employed the PROCESS macro bootstrapping procedure ($n=5000$, Hayes (2017) model 7). The predictor was debunking fake ads (debunked fake ad (ad claims debunked = 1), non-debunked fake ad (ad claims not debunked = 0), the moderator was gender (male = 0, female = 1), the mediator was attitudes toward the brand, and the criterion was purchase intentions. The analysis revealed the presence of moderated mediation through attitudes toward the brand (Index of moderated mediation = $-1.58, 95\% CI = -2.49$ to -0.65). Next, we examined the conditional indirect effects of debunking the fake ads on purchase intentions for males and females. We found that the indirect effect (fake ads \rightarrow

attitudes toward the brand → purchase intentions) was significant for females ($B = -1.99$, 95% $CI = -1.66$ to -1.27). In contrast, this indirect effect was not significant for males ($B = -0.42$, 95% $CI = -1.01$ to 0.20). Additionally, we found that the direct effect of fake ads on purchase intentions was not significant ($B = 0.11$, 95% $CI = -0.19$ to 0.41), indicating full mediation by attitudes toward the brand. Thus, H2 was supported.

Auxiliary analysis. Beyond testing for H1 and H2 above, we also wanted to compare the effect of debunking the fake claims made in the ad across males and females. Comparing these responses can help us determine the differential impact of debunking the fake ads between males and females and the consequences for the brands.

In order to compare consumers' reactions before and after being presented with the debunking information, we used a 2 (Gender: male vs. female) cell repeated-measures design with purchase intentions as the dependent variable ($\alpha = 0.91$). We found that gender had a statistically significant effect on purchase intentions ($F(1, 91) = 7.20$, $p < 0.05$), such that females demonstrated a significant lowering of purchase intentions for the advertised product after they are informed that the ad contained fake claims. No significant difference was found between pre- and post-debunking measures for purchase intentions in the case of males. Similar results were obtained with attitudes toward the brand ($\alpha = 0.92$) as the dependent variable ($F(1, 91) = 16.05$, $p < .01$). Graphs in Figure 3 compare pre- and post-debunking responses for males and females.

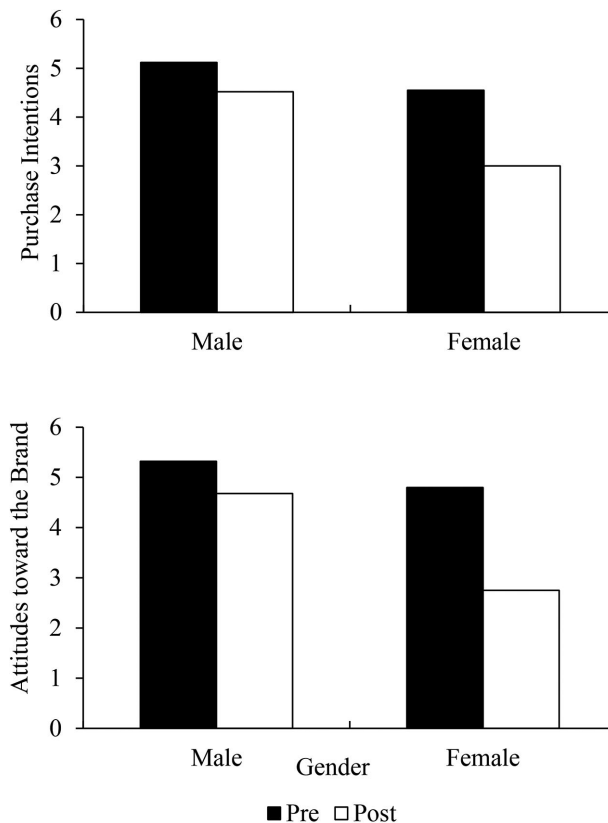


Figure 3. Gender differences in pre- and post-debunking treatments in Study 1.

Discussion

The results indicate that attitudes toward the brand mediate the effect of debunking the fake advertisement on purchase intention. Furthermore, gender significantly moderates the effect of debunking the fake claims made in the ad on purchase intentions, and consumer attitudes toward the brand mediate these effects. In contrast to females, males showed more favorable attitudes and higher purchase intentions toward the product shown in the ad, despite receiving information that the claims made in the ad were fake. We also found differences in the impact of debunking the claims made in the ad across gender within the fake ad treatment group. Comparing the pre- and post-debunking purchase intentions measures, we found that when presented with information declaring the ad to be fake, females showed significantly less favorable attitudes toward the brand and lower purchase intentions in contrast to males.

Role of perceived health risk

Any purchase comes with various types of perceived risks (e.g. physical, psychological, social, financial, and performance) (Kaplan, Szybillo, and Jacoby 1974). In the context of health-related products, the perceived physical (i.e. health) risk associated with the purchase is paramount (Jacoby and Kaplan 1972). Given that the context of our fake ads is for health-related products, customer's health-related concerns can provide us with further understanding of the moderated mediation mechanism. Thus, below, we explore the literature of consumer's perceived health risk in the context of debunking fake ads and develop a conceptual background for the serial moderated mediation hypothesis with gender as the moderator, and perceived health risk and attitudes toward the brand as serial mediators. Perceived health risk (Shin and Kang 2020, 2) is defined as an individual's 'perceived risk to their physical health as a result of uncontrolled events associated with terrorism, political situation, natural disasters, and pandemic'. Studies have shown that an individual's health risk perception can drive preventive behaviors in unpredictable situations where new diseases can cause significant health harm (Slovic 1987).

Research has also shown that gender is an important driver of the perception of health risks. In general, females are more likely to recognize health risks compared to males and to follow recommended behaviors, such as hand washing and wearing masks (Rubin et al. 2009). Females have also been shown to demonstrate greater interest in health matters (Verbrugge 1989) and demonstrate higher compliance with health-related behaviors compared to males (Galasso et al. 2020). Thus, female consumers exposed to the debunking ad claim will have greater perceived health risk toward an ad with the fake product claim than males. This higher level of perceived health risk originating from the critical processing of the information in the advertisement on behalf of female customers with the fake product claim should intensify the negative attitudes toward the brand. On the other hand, for male consumers, the perceived health risk will be comparatively lower, leading to comparatively more favorable brand attitudes than for female consumers. In the absence of the debunking information, we expect similar differences in perceived health risk and brand attitudes among male and female consumers. That is, perceived health risk levels

will be significantly lower, and attitudes toward the brand would be significantly more favorable for both males and females in the absence of debunking information compared to when debunking information is present. Formally, the above discussion is presented in the hypotheses below:

H3: The negative impact of the presence (vs. absence) of debunking information regarding fake claims in an ad on purchase intentions will (will not) be serially mediated by perceived health risk and attitudes toward the brand.

H4: The serial mediation between debunking information regarding fake claims in an ad on purchase intentions will be moderated by gender, such that females (vs. males) will exhibit higher levels of perceived health risk and less favorable attitudes toward the brand.

Study 2

Study 2 aims to test H3 and H4. In H3, we seek to establish the serial mediation effects of perceived health risk and attitudes toward the brand between debunking the fake claims made in the ad and purchase intentions. In H4, we aim to test the moderating role of gender on the relationship between debunking fake ads and perceived health risk. We also replicate the main findings of the previous studies. As an auxiliary analysis, we validate the findings of Study 1 by comparing the impact of gender on the pre- and post-debunking consumer responses.

Design and sample

195 general consumers from MTurk (at least 18 years old; 48.5% female) participated in the study and were compensated monetarily. We used a 2 (debunking fake ads: debunked fake ad vs. non-debunked fake ad) X 2 (Gender: male vs. female) design. Similar to Study 1, the subjects were randomly assigned to one of the two conditions. At the end of the questionnaire, participants were asked to state their gender, which served as the other between-subjects factor.

Manipulations and procedures

The procedure and stimuli for the experiment were analogous to Study 1. To create the ad that presented the fake claims, a real COVID-19 product – a hand sanitizer – was selected from our repository of shortlisted products, and a realistic ad for a fictitious brand, ACTIVEPLUS, was developed. The ad claimed that ACTIVEPLUS's hand sanitizer could fight COVID-19 for up to 8 hours. Next, similar to studies 1 and 2, we created a WSJ article refuting the claims in the ad. The refutation read, '...However, according to FDA, such claims are unsubstantiated. Moreover, FDA has not approved any commercial sanitizers that can have such a lasting impact and warned consumers to be wary of unauthorized hand sanitizers'. The tone, wording, word count, and content of information were kept similar to the WSJ article in Study 1. The survey was again set in such a way that the respondents would need to spend at least 20 seconds on the WSJ article before responding to the post-WSJ article measures in case of the debunked fake ad condition. The remaining procedure for the experiment was also kept the same as in Study 1. [Figure 4](#) shows the stimuli for the two conditions in the experiment.

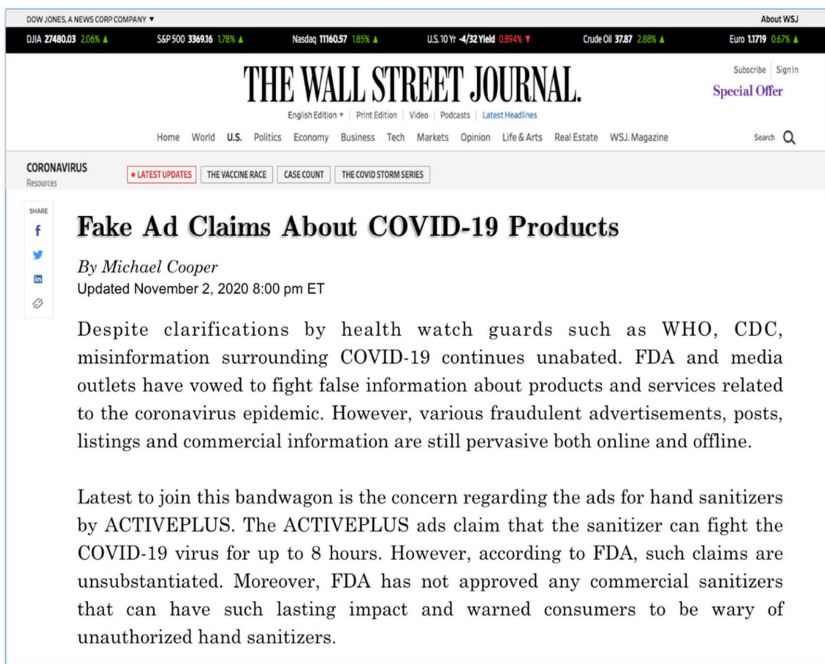


Figure 4. Manipulation of fake ads and debunking article in Studies 2 and 3.

Measures

All measures were analogous to the previous studies. An additional four-item scale, adopted from Shin and Kang (2020), for measuring perceived health risk was also included. The items asked the respondents the following questions on a seven-point Likert-type scale (1 = *strongly disagree*; 7 = *strongly agree*) 'I feel nervous about using

ACTIVEPLUS hand sanitizer because of health concerns'/'Using ACTIVEPLUS hand sanitizer is a risky decision for my health'/'I feel uncomfortable using ACTIVEPLUS hand sanitizer because of my health safety'/'There is a high probability that ACTIVEPLUS hand sanitizer would lead to a health problem'. The reliability levels, measured by Cronbach's alpha, for purchase intentions ($\alpha=0.92$), attitudes toward the brand ($\alpha=0.84$), and perceived health risk ($\alpha=0.94$) were above the accepted level. The rest of the measures utilized were identical to the previous studies.

Results

Manipulation check. Similar to the previous studies, participants in the debunked fake ad condition (ad claim debunked) were asked, 'According to the Wall Street Journal article that you read, the ad for ACTIVEPLUS's hand sanitizer was fake' (Y/N). Manipulation check results showed a significant difference between the 'yes' (87.1%) and 'no' responses ($\chi^2(1) = 51.19, p < 0.01$), indicating that the manipulation was successful.

Empirical findings. In order to test H3 and H4, we employed the PROCESS macro bootstrapping procedure ($n=5000$, Hayes (2017) model 85) for testing moderated serial mediation. The model included debunking fake ad (non-debunked fake ad (ad claims not debunked) = 0, debunked fake ad (ad claims debunked) = 1) as the predictor variable, gender as moderator, perceived health risk as mediator 1 (M1), attitudes toward the brand as mediator 2 (M2) and purchase intentions as the dependent variable (Y). The analysis showed that the indirect effects of serial mediation were significant (debunked fake ads \rightarrow perceived health risk \rightarrow attitudes toward the brand \rightarrow purchase intentions) for females ($B = -0.21, 95\% CI = -0.43$ to -0.04) but not for males ($B = -0.09, 95\% CI = -0.22$ to 0). The index of moderated mediation was found to be significant ($B = -0.12, 95\% CI = -0.33$ to -0.01). The direct effect of debunking the fake ads on purchase intentions was found to be not significant ($B = -0.25, 95\% CI = -0.6$ to 0.09), indicating full mediation. Additionally, we found that attitudes toward the brand had a significant impact on purchase intentions ($B = 0.86, 95\% CI = 0.78$ to 0.95). Thus, we found support for H3 and H4. We found that perceived health risk and consumer attitudes toward the brand mediate the relationship between debunking of fake ads and purchase intentions and that gender moderates the relationship between debunking of fake ads and perceived health risks.

Auxiliary analysis. Similar to Study 1, we conducted an additional analysis to compare the differences in consumer reactions before and after being presented with the debunking information across males and females. For this, we used a 2 (Gender: male vs. female) cell repeated-measures analysis of variance (ANOVA) with purchase intentions as the dependent variable ($\alpha=0.83$). We found that gender had a statistically significant effect on purchase intentions ($F(1, 92) = 27.20, p < .01$), such that females showed a significant decrease in purchase intentions for the advertised product after being presented with information that debunked the claims made in the ad. However, in the case of males, no

significant differences were found between pre- and post-debunking information in purchase intentions. Similar results were obtained with attitudes toward the brand as the dependent variable ($\alpha=0.84$) ($F(1, 92) = 4.44, p < 0.05$). Graphs in [Figure 5](#) show the comparison of pre- and post-debunking responses for males and females.

Discussion

The results indicate that consumers' perceived health risk mediates the relationship between debunking fake ads and consumer attitudes toward the brand and purchase intentions. We find support that an increase in perceived health risk leads to less favorable consumer attitudes toward the brand resulting in lower purchase intentions. We also establish the moderating role of gender and show that, in response to the debunking of fake claims in ads, in contrast to males, females are more likely to show greater perceived health risk leading to less favorable attitudes toward the brand and lower purchase intentions. We also corroborate our findings for gender differences in consumer responses within the fake ad condition wherein the respondents are presented with the debunking information. A comparison of consumers' pre- and post-debunking responses showed that debunking fake claims was more effective in female consumers than male consumers. We find that when presented with information declaring the claims in the ad for the product to be fake, females showed significantly less favorable attitudes toward the brand and lower purchase intentions in contrast to males.

Information processing confidence and skepticism toward the ad

The differential effects observed above among males and females might be further explained by examining how the two genders might process information regarding the claims in the ad and the subsequent debunking information differently. There is a significant body of literature in information processing (IPC) that has observed the differential effects of gender (Meyers-Levy 1988, Darley and Smith 1995, Kempf, Palan, and Laczniak 1997). Thus, below, we focus on a more nuanced approach in exploring the variant effects across males and females by incorporating the tenets of information processing theory, more specifically, (IPC). The theory of IPC defines confidence as a person's degree of self-evaluation of a person's own capability to process information (Wright 1975). Research in information processing shows that males and females tend to process information differently. Females generally tend to have lower IPC than their male counterparts (Darley and Smith 1995; Kempf, Palan, and Laczniak 1997), and, thus, they have a lower threshold to engage in information elaboration (Meyers-Levy 1988). Hence, due to their lower IPC, females tend to elaborate the information cognitively more often while males tend to process information more heuristically (Darley and Smith 1995; Meyers-Levy and Maheswaran 1991). Research has also shown that females generally are more skeptical of information in an advertisement, such as claims made in an ad, (Matthes, Wonneberger, and Schmuck 2014) compared to their male counterparts (Berney-Reddish and Areni 2006; Papyrina 2015). Furthermore, past research has

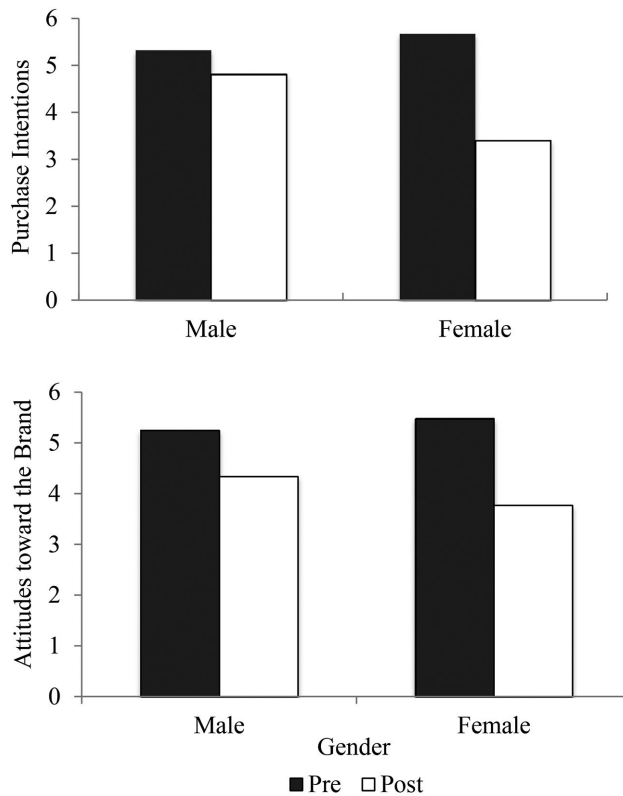


Figure 5. Gender differences in pre- and post-debunking treatments in Study 2.

shown that higher elaboration of an advertisement can lead to higher levels of skepticism toward the ad (Petty, Cacioppo, and Schumann 1983). Hence, owing to their lower levels of IPC, we should expect females (vs. males) to elaborate more on the information in an ad, including the claims in the ad, and this should lead them to possess higher skepticism toward the claims made in the advertisement.

Thus, we propose that when consumers are exposed to an advertisement containing fake product claims followed by the WSJ debunking article, owing to their lower levels of IPC, females will elaborate and process the information in the ad cognitively (specifically, the claim made in the ad) and will exhibit higher levels of skepticism toward the ad compared to males. On the other hand, men, owing to their higher IPC, will elaborate less and process the information heuristically and, hence, will have lower levels of skepticism toward the claims made in the advertisement. Thus, the ad, followed by the debunking information, will lead to higher levels of skepticism toward the claim made in the ad, which will lead to higher levels of perceived health risk from using the product for females (vs. males). This higher level of perceived health risk in females (vs. males) will further lead to more negative attitudes toward the brand and, finally, lower purchase intentions. Formally we can state this as:

H5: The negative impact of the presence (vs. absence) of debunking information regarding fake claims in an ad on purchase intentions will (will not) be serially mediated by skepticism toward the advertisement, perception of health risk, and attitudes toward the brand.

H6: The serial mediation between debunking information regarding fake claims in an ad on purchase intentions will be moderated by gender, such that females (vs. males) will exhibit greater skepticism toward the advertisement, higher levels of perceived health risk, and less favorable attitudes toward the brand.

Study 3

The primary focus of Study 3 is to help explain the differential effects that we observed across males and females in the earlier studies by testing H5 and H6. We use the theory of information processing, more specifically IPC, and theorize that the differential information processing effects between males and females will lead to varying levels of the downstream effects of skepticism regarding the claims made in the ad which, in turn, will lead to the differential effects we observed across males and females when they are exposed to the advertisement with fake product claims followed by the debunking information from the WSJ article.

Design and sample

295 respondents were recruited from MTurk (at least 18 years old; 48.5% female) and were compensated monetarily. We used a 2 (debunking fake ads: debunked fake ad vs. non-debunked fake ad) X 2 (Gender: female vs. male) design. Similar to Studies 1 and 2, the subjects were randomly assigned to one of the two conditions. At the end of the questionnaire, participants were asked to state their gender, which served as the other between-subjects factor.

Manipulations and procedures

The procedure and stimuli for the experiment were identical to Study 2. Also, like Studies 1 and 2, the survey was set in such a way that the respondents would need to spend at least 20 seconds on the WSJ article before responding to the post-WSJ article measures in the case of the debunked fake ad condition. The remaining procedure for the experiment was the same as the previous studies.

Measures

All measures were analogous to the previous studies. An additional seven-item Likert scale (1 = *strongly disagree*; 7 = *strongly agree*), modified from Obermiller and Spangenberg (1998), was used to measure skepticism toward the advertisement. The scale items can be found in Appendix. The reliability levels, measured by Cronbach's alpha, for purchase intentions ($\alpha=0.93$), attitudes toward the brand ($\alpha=0.86$), perceived health risk ($\alpha=0.94$), and skepticism toward the ad ($\alpha=0.98$) were well above the accepted level. The rest of the measures utilized were identical to the previous studies.

Results

Manipulation check. Similar to the previous studies, participants were asked, 'The ad for the ACTIVEPLUS's hand sanitizer was fake' (Y/N). Manipulation check results showed a significant difference ($\chi^2(1) = 62.65, p < 0.01$) across the debunked fake ad (Yes = 90.3%) vs. the non-debunked fake ad condition (Yes = 47%), indicating that the manipulation was successful. We used a continuous manipulation check in this study as an additional manipulation check. The item we used for the continuous measure is a Likert-type item measured on a seven-point scale (1 = *strongly disagree*; 7 = *strongly agree*) and asked the respondents the following question 'The ad claims in the ActivePlus hand sanitizer ad were fake'. Again, the findings showed a significant difference in perceptions across the debunked fake ad vs. the non-debunked fake ad condition ($t(294) = 3.88, p < .01, M_{\text{debunked fake ad}} = 5.09, M_{\text{non-debunked fake ad}} = 4.16$)

Empirical findings. To test H5 and H6, we employed custom models developed to test a serial mediation with three mediators and a moderated mediation with three serial mediators. PROCESS does not provide models to test a serial mediation or serial moderated mediation with three mediators. The model was developed based on the instruction from Hayes (2017).

For testing H5, our model included the debunking condition (debunked fake ad = 1, non-debunked fake ad = 0) as the predictor variable, skepticism toward an advertisement = mediator 1 (M1), perceived health risk as mediator 2 (M2), attitudes toward the brand as mediator 3 (M3) and purchase intentions as the dependent variable (Y). The analysis showed that the indirect effects of serial mediation were significant (debunked fake ad → skepticism toward the ad → perceived health risk → attitudes toward the brand → purchase intentions) ($B = -0.1, 95\% CI = -0.24 \text{ to } -0.01$). The direct effect of debunking the fake ads on purchase intentions was also found to be significant ($B = -0.26, 95\% CI = -0.44 \text{ to } -0.09$), indicating partial mediation.

For testing H6, our model included the debunking condition (debunked fake ad = 1, non-debunked fake ad = 0) as the predictor variable, gender as moderator, skepticism toward an advertisement as mediator 1 (M1), perceived health risk as mediator 2 (M2), attitudes toward the brand as mediator 3 (M3) and purchase intentions as the dependent variable (Y). The analysis showed that the indirect effects of serial mediation were significant (debunked fake ad → skepticism toward the ad → perceived health risk → attitudes toward the brand → purchase intentions) for females ($B = -0.31, 95\% CI = -0.57 \text{ to } -0.07$) but not for males ($B = -0.06, 95\% CI = -0.03 \text{ to } 0.17$). The index of moderated mediation was found to be significant ($B = -0.37, 95\% CI = -0.66 \text{ to } -0.1$). The direct effect of debunking the fake ads on purchase intentions was found to be significant ($B = -0.27, 95\% CI = -0.44 \text{ to } -0.1$), indicating partial mediation.

Thus, we found support for H5 and H6. We found that for females, the effect of debunking the fake ad is serially mediated by skepticism toward the ad, perceived health risk, and attitudes toward the brand on purchase intentions. However, for males, the serial mediation effect is not significant.

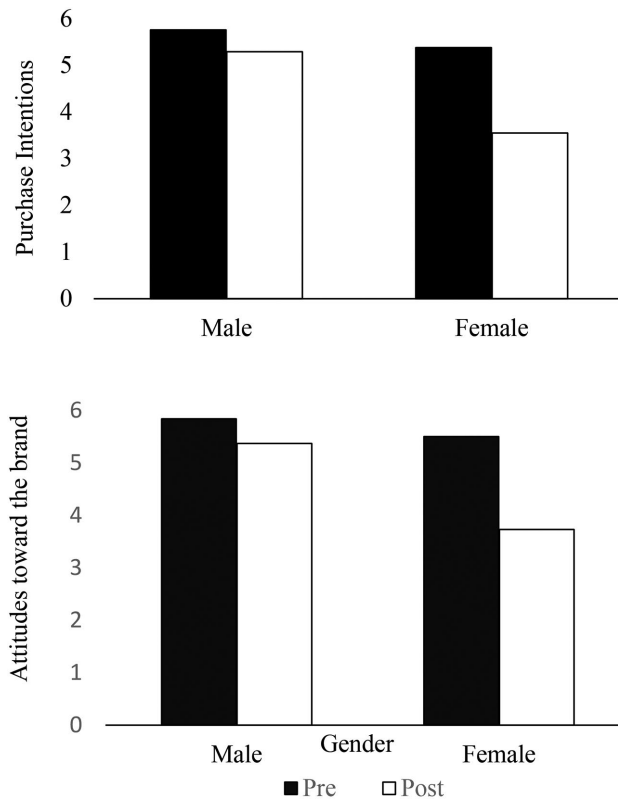


Figure 6. Gender differences in pre- and post-debunking treatments in Study 3.

Auxiliary analysis. Similar to Studies 1 and 2, we conducted an additional analysis to compare the difference in consumer reactions before and after being presented with the debunking information across males and females. For this, we used a 2 (Gender: male vs. female) cell repeated-measures analysis of variance (ANOVA) with purchase intentions as the dependent variable ($\alpha=0.85$). We found that gender had a statistically significant effect on purchase intentions ($F(1, 141) = 32.38, p < .001$) across the pre- and post-measures of purchase intentions, such that females showed a significant lowering of purchase intentions for the advertised product after being presented with information that debunked the claims made in the ad for the product. However, in the case of males, no significant difference was found between pre- and post-debunking in purchase intentions. Similar results were obtained with attitudes toward the brand as the dependent variable ($\alpha=0.76$) ($F(1, 141) = 30, p < 0.01$). Graphs in Figure 6 show the comparison of pre- and post-debunking responses for males and females.

Discussion

The results lend further insight and support to how information processing confidence explains the differential effects of gender. Due to their low information processing confidence, females will elaborate more on the information from the fake ad and the

WSJ article and, consequently, become skeptical toward the ad and the claims made in the ad owing to the contradictory information in the ad and the WSJ article. This higher level of skepticism toward the ad among females will lead to higher levels of perceived health risks, less favorable attitudes toward the brand, and, finally, lower levels of purchase intention. Thus, for females, the effects of debunking the ad on purchase intentions will be serially mediated through skepticism toward the ad, perceived health risks, and attitudes toward the brand. On the other hand, males, owing to their high information processing confidence, will not elaborate the information in the ad and the WSJ article. Hence, males will not exhibit the higher levels of skepticism observed in females, and skepticism, health perceptions, and attitudes toward the brand will not serially mediate the effect of the debunking of the ad on purchase intention for males. As in Studies 1 and 2, a comparison of pre- and post-debunking responses shows that the debunking of fake claims was more effective in the case of females compared to males. For females, purchase intentions were lower and attitudes toward the brand were less favorable after the debunking information was presented compared to before the debunking information was presented. For males, there was no difference across pre- and post-debunking levels of purchase intention and attitudes toward the brand.

General discussion

Ads making fake claims about the benefits of products are a significant challenge for both marketers and public policymakers because they can erode trust in authentic products and reduce the effectiveness of ad campaigns. Here, we investigate this important notion of fake ads in the context of the health industry. We find that when female consumers are exposed to debunking information provided through a news article, it negatively affects attitudes toward the brand and, consequently, lowers purchase intentions for a product advertised using fake claims. However, the debunking information does not lead to any difference in attitudes toward the brand and, consequently, purchase intention for male consumers. Next, we explore the effects of debunking information and gender further and establish that, owing to higher perceived health risks, females will exhibit less favorable attitudes toward the brand and lower purchase intentions for the brand that uses fake ads than males. Finally, we introduce the theory of information processing confidence and show that owing to lower levels of information processing confidence in females (vs. males) when debunking information is provided, they will be more skeptical toward the ad, and this, in turn, will lead to a trickle-down effect where higher levels of perceived health risks will lead to less favorable attitudes toward the brand and, finally, to lower levels of purchase intention.

Our research makes several important contributions to the literature of fake advertisements. For instance, this research provides a theory-based investigation of the role of consumer attitudes toward the brand, gender, perceived health risk, and skepticism toward the ad in determining purchase intentions for products displayed in fake ads. Theoretically, our work draws from established advertising theories, such as the elaboration likelihood model, heuristic and systematic processing, information processing confidence, and the selectivity model. Furthermore, our research makes

important contributions by examining the role of gender and perceived health risk in shaping consumer decision-making related to fake ads. This research is the first to provide insights into the impacts of gender on susceptibility toward fake ads. By demonstrating that females are less likely to purchase products shown in fake ads than males when presented with debunking information, we provide further evidence of gender differences in the selectivity model (Meyers-Levy 1986, Meyers-Levy and Sternthal 1991, Meyers-Levy and Maheswaran 1991). By illuminating an integrated understanding of the impacts of perceived health risk and gender on consumer decision-making for products shown in fake ads, we add to ongoing work that has attempted to understand the factors influencing susceptibility to misinformation (Roozenbeek et al. 2020, Pennycook et al. 2020). Our research is also the first where the differential effects of debunking information and gender on skepticism toward an advertisement have been explored using the theory of information processing and, more specifically, information processing confidence. Thus, our research establishes an important and interesting link between these three variables from a theoretical perspective and validates the proposed linkage through empirical research. While existing work has shown the impacts of political ideology (Calvillo et al. 2020), our work is among the first to demonstrate the role of perceived health risk and gender in consumer decision-making for products that make fake claims regarding product benefits.

Our study also provides useful insights for public policy professionals and advertisers. Our findings offer supporting evidence regarding the effectiveness of debunking information and, in turn, provide policymakers with a tool using which they can target female customers and alleviate the adverse effects arising from the spread of misinformation via fake ads. Furthermore, our demonstration of the effectiveness of debunking efforts of fake ads through a WSJ article opens the possibility of the many other outlets which policymakers can use to target their debunking effort toward women. Such outlets can include magazines such as 'Cosmopolitan' or 'Women's Health' or websites or blogs such as '85 Broads' or 'Betty Confidential' which are specifically targeted and accessed by females (Ipsos 2013). Furthermore, our research provides a cautionary note for advertisers. Our findings imply that when debunking information is provided for products that firms advertise using misleading claims, it can have negative downstream effects on female consumers that would be detrimental to the advertising firm and the products they sell. Also, the negative attitudes toward the brand that result from the debunking of a fake ad can linger in the long run and can potentially negatively affect intentions to purchase future products based on ads from the same brand (Darke, Ashworth, and Ritchie 2008).

Certain limitations in our work illuminate avenues for future research. Prior research indicates that susceptibility to misinformation can depend on political, cultural, or social factors. Belief in misinformation has been shown to vary by nationality (Roozenbeek et al. 2020). It would be interesting for future research to examine how variations in purchase decisions based on ads making fake claims depend on national or cultural factors. Also, research has shown that misinformation perceptions are grounded in an individual's identification with a party or political ideology (Jerit and Zhao 2020). Furthermore, gender differences have also been observed in terms of political ideology. Females tend to be more conservative compared to their male

counterparts (De Vaus and McAllister 1989). Thus, debunking efforts based on gender and political leaning (O'Connor and Weatherall 2019) and the political standing of an individual might also be interesting to explore in the future.

When it comes to fake ad campaigns in the healthcare industry, prior research has shown that females, compared to males, tend to show more precautionary health behaviors and make more conservative decisions owing to lower levels of risk tolerance among them (Fan, Orhun, and Turjeman 2020). Thus, it might be interesting for future research to explore if risk tolerance perception varies across males and females for fake ads. This knowledge can help in targeting selective debunking efforts toward male and female consumers. The regulatory focus of a person can similarly be another interesting variable to explore. Research shows that if there is a regulatory fit between a person's regulatory focus and the information they see, then there is a higher chance of the person being persuaded by the information (Kim and Sung 2013). Research has also shown that the regulatory focus of a person dictates privacy preferences across social media sites, with promotion-focused individuals being less restrictive in their privacy setting and prevention-focused individuals being more restrictive (Cho, Roh, and Park 2019). Thus, future research can explore the fit between debunking messages and a person's regulatory focus and the efficacy of selectively targeting these messages through social media websites so that there is a fit between the message and the person's regulatory focus.

Also, our research did not explore what type of debunking methods may work for males. Past research has shown that males tend to focus more on elaborating information when they need to recall old information (Meyers-Levy and Sternthal 1991). Furthermore, research has shown that males tend to spend more time reading news on business, politics, and sports (Knobloch-Westerwick and Alter 2007). Thus, future research can explore debunking efforts targeted to males by selectively targeting communication mediums such as news or magazines that publish topics males are interested in (business, sports, news, and political). Thus, the debunking efforts can explore debunking messages that would necessitate males to recall past information.

Furthermore, as discussed in our development of H1, our research focuses on 'falsification,' which is one of the three types of deceptive practices. It would be interesting to explore the effectiveness of debunking in the other two cases (i.e. when sellers either use 'concealment' or 'equivocation' methods to deceive customers).

To conclude, our work provides important insights into consumer behavior in the context of advertisement research. Our findings on the role of gender and perceived health risk in shaping consumers' reactions to fake ads contribute to theory while, at the same time, providing valuable guidance for advertisers and policymakers in countering the impacts of fake ads.

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Appendix

Skepticism Toward Ad Scale modified from Obermiller and Spangenberg (1998).

(1 = *strongly disagree*; 7 = *strongly agree*)

1. I can depend on getting the truth in the ActivePlus hand sanitizer advertisement.
2. The ActivePlus hand sanitizer advertisement's aim is to inform me.
3. I believe the ActivePlus hand sanitizer advertisement is informative.
4. The ActivePlus hand sanitizer advertisement is truthful.
5. The ActivePlus hand sanitizer advertisement is a reliable source of information about the quality and performance of this product.
6. The ActivePlus hand sanitizer advertisement is truth well told.
7. The ActivePlus hand sanitizer advertisement presents a true picture of this product.
8. I feel I am accurately informed after viewing the ActivePlus hand sanitizer advertisement.