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UNDERSTANDING PERCEIVED FAKENESS OF ONLINE HEALTH NEWS IN HONG KONG

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ABSTRACT

Given the vast amount of incorrect health information circulated online, it is reasonable to question how everyday audience process the health news they see shared on social media. This study identifies the mechanism behind evaluating a piece of health content shared on social media to be fake. An online experiment in Hong Kong exposed participants (N = 135) to a simulated Facebook news post claiming that the consumption of milk could be harmful, manipulating the source to be either a legacy media outlet or an unfamiliar online health source. Individuals with different prior views on milk consumption assessed the fakeness of the same fake health news item significantly differently. The findings contribute to digital literacy research, such that practitioners should take motivated perception of health news into account. Further, online sources which are less seen to be motivated by financial profits are likely to be trusted.

Keywords: Digital Literacy, Disinformation, Fake News, Health news, Motivated Reasoning, News Audience, Online News, Social Media, Hong Kong

INTRODUCTION

Health promotion aims to help people make informed health decisions. While many researchers have examined the relationship between health interventions and health outcomes, this study took a step back and assessed how audience evaluate health information—specifically, how they assess the quality of health content published by either a legacy news outlet or a health website. Since people consume and discuss health-related topics on social media platforms, such as Facebook (McNab, 2009), and a vast number of health information sources are active on Facebook, this platform offers an ideal context for testing the processing of online health information.

As few people have direct connections to scientific health findings, mass media is often their primary source of scientific information (Schäfer, 2012). It is not uncommon for news outlets to pick up medical or health research findings and disseminate them to the public. This information can be essential in influencing public attitudes, behaviors, and policy-related decisions concerning health-related issues (Davies & Horst, 2016). Prior to the digital age, people mostly depended on legacy media outlets for their health information, but the emerging digital media environment has created

new alternatives and enabled laypeople to gain exposure to a wide variety of additional sources of health news (Sudau et al., 2014).

However, this increased access to information brings with it the challenge of discerning how much of the information being circulated is false (Tambuscio et al., 2015). While legacy outlets have both editorial management and fact-checking, producers of content online are not bound by the ethical and professional standards that professionals are. Consequently, the quality of online health information is often questionable. Owing to the spread of unverified information and proliferation of online news pages and blogs that are not published by professional journalists or established news outlets, this study aimed to identify whether health information from a legacy media outlet is perceived differently from information attributed to an unfamiliar health source online.

LITERATURE REVIEW

Fakeness Assessments

According to Nielson and Graves (2017), ordinary citizens do not distinguish fake news from genuine news in a straightforward manner, and their use and understanding of fake news varies widely. In fact, individuals identify fake news across a wide spectrum ranging from propaganda to sponsored content and from advertising that is intended to mislead to poor journalism. Therefore, using a seven-point scale from not at all fake to extremely fake, this study sought to answer two major questions. First, does the information source play a role in audience evaluations of health information? Second, is audience processing of the health information influenced by their prior health beliefs? Findings suggest that individuals holding different prior beliefs on milk consumption assessed the fakeness of the health news item significantly differently. In addition, sources which are less seen to be motivated by financial profits are less likely to be seen as fake.

Based on definitions of fake news (Allcott & Gentzkow, 2017; Tandoc et al., 2018; Wardle, 2017), when asked to identify whether a news story is fake, audience must make this determination in light of two components: whether the content is false and the source's intent. While Allcott and Gentzkow (2017) define fake news as 'news articles that are intentionally and verifiably false, and could mislead readers' (p.213), Wardle (2017) defines fake news as news that is fabricated and created for financial gain or to achieve political aims. Following these conceptualizations, this study focused on the extent to which news audience perceive news content as deliberately false and to what degree they perceive an intent to spread such content for ideological or financial purposes (Tandoc et al., 2018). Therefore, besides perceived fakeness, this study examined two other core components of fake news perception: perceived inaccuracy and perceived intent to pursue financial gain.

Perceived Inaccuracy

As health news is supposed to provide audience with novel information, consumers of the news seldom have the capacity to determine its truthfulness (Tsang, 2019b). The dilemma is that the news is almost always expected to disseminate new information. Since most definitions of news refer to it as information not previously known to audience, if the consumers are able to judge the accuracy of the information without possessing additional knowledge, then the news is not performing its function as news. Therefore, it is vital to study how individuals form perceptions of accuracy and, in

turn, determine whether a news story is true. This is in fact consistent with the definitions of fake news, such that the content has to involve false element(s) to constitute fake news. In this study, such element will be examined from an audience's perspective, asking participants to report to what extent they find news content to be exaggerated, misleading, incomplete, and inaccurate (Tsang, 2020a; 2020b).

Perceived Financial Motive

In addition to perceived inaccuracy, audience can find it difficult to correctly determine the intent of an information source by simply reading the content. According to advertising research on the perceived intent of advertisers, consumers who view an advertiser's intent as manipulative will likely perceive both the advertiser and the advertisement negatively (Cotte et al., 2005). Furthermore, such a perception of intent has been found to drive consumers to resist the advertisement (Eagly et al., 1978; Wood & Eagly, 1981). Consistent with these findings on consumers perceiving the strategic tactics of advertisers as manipulative (Campbell, 1995), this study tested the mediating role of perceived intent between perceived inaccuracy and fakeness.

In a health context, the perceived intent would possibly be to promote a health treatment or to reap financial benefits through promoting products, such as prescription drugs, medical treatments, or milk alternatives. Regarding the stimulus used in this study—published research findings on the risks of milk consumption—participants were anticipated to perceive the news story as a sponsored post, where the intent was to assist advertisers in making a financial gain. In other words, the process from the initial judgment about whether the health news story is erroneous to the final judgment on whether the story is fake might depend on the extent to which the participant perceives the underlying presence of malicious intent for financial gain.

Health Information Sources

As considerable false information is now circulated online, and social media platforms, such as Facebook, are used by hundreds of millions of people to communicate about an infinite range of topics, including health (McNab, 2009), news content on Facebook demands serious examination. As of June 2017, there were 5.2 million Facebook accounts registered in Hong Kong (Miniwatts Marketing Group, 2018), meaning that approximately 69.4% of the Hong Kong population has a Facebook account, assuming that each account represents an individual person. On the platform, individuals and organizations utilize their pages to reach out to Facebook users. Some are legacy media groups, which are established outlets, whereas others are less professional and less established outlets.

In fact, the source of information has always been a major factor in estimating information credibility. Individuals have reported that they tend to prefer and believe reputable sources (Nyhan et al., 2012). Legacy news outlets that are known to the public are likely to be viewed as authoritative and reliable sources (Metzger et al., 2010; Qayyum & Williamson, 2014). Recent reports have noted a rise in reliance on legacy news due to concerns about the quality of information. In the Reuters Institute Digital News Report (Newman et al., 2019), 26% of the sample stated that they had begun to rely more on news brands that they deem reputable owing to growing concerns over false information.

By contrast, online news content sometimes comes from less reputable sources, such as online forums and blogs. These sources publish purely health-related information on a regular basis, including articles on health, diets, wellness, and fitness. Examples are Health Digest (www.healthdigest.com), which has 11 million followers on Facebook, and Everyday Health (<http://www.everydayhealth.com>), which has approximately 1.5 million followers on Facebook (both

follower counts are accurate as of October 2019). Although these sites might have fewer credentials, since their news is not mainly produced by knowledgeable forum users and unreliable laypeople, they might be seen as professional health publishers with special expertise compared to legacy news outlets. In addition, these online health sources might be seen as trustworthy because they usually are not perceived as intending to manipulate (Winter & Kramer, 2014).

Prior Health Belief

Further, according to the motivated reasoning literature (Kunda, 1990), people are often motivated to justify their prior beliefs. To protect one's own belief system and, in turn, one's identity, accuracy is sometimes compromised. In this sense, when exposed to something congruent with their prior beliefs, people tend to process that information in a more positive light and accept it at face value. However, when exposed to some conflicting information, they tend to discredit and counter-argue that information. Often, people perform selective exposure as a means to combat the psychological discomfort aroused (Tsang, 2019a). Accordingly, prior health beliefs were expected to play a role in perceived news fakeness, accuracy, and intent, such that individuals holding different health beliefs would process and evaluate the information to significantly different extents.

When asking participants who believe that milk consumption is beneficial and participants who believe otherwise the extent to which they perceive a news message as invented, fabricated, and fake, these two groups of participants should assess the exact same content significantly differently. The same would apply when asking participants to what extent they find a news message to be misleading, exaggerated and erroneous, and politically motivated. Indeed, Kahne and Bowyer (2017) found that whether the claims in online posts aligned with one's prior position played a much larger role than whether the post was factually correct in people's accuracy assessments. Besides examining the effects of prior beliefs on individuals' health information perceptions, the interaction between source and prior beliefs was explored.

METHOD

Design and Stimuli

To understand the way audience determinate fake from true health news, this study examined a total of three core elements derived from conventional definitions of fake news: to what extent news content was perceived to be fake, inaccurate, and intend to pursue financial gain. Not only was perceived intent expected to mediate the relationship between perceived inaccuracy and perceived fakeness, source attribution was tested to explore whether attribution to a legacy news outlet and attribution to an online health source produce different impacts on the three criterion variables. More importantly, consistent with motivated reasoning literature, participants holding different prior health beliefs were tested if they evaluate news fakeness to significantly different degrees. Lastly, this study expected source attribution to interact with prior health beliefs on perceived news fakeness, inaccuracy, and financial motivations.

Research Questions and Research Hypotheses

H1: Perceived pursuit of financial gain mediates the relationship between perceived inaccuracy and perceived news fakeness.

RQ1: What are the effects of source attribution on (a) perceived news fakeness, (b) perceived inaccuracy, and (c) perceived financial intent?

H2: Compared to anti-milk participants, pro-milk participants will rate the anti-milk news post as significantly (a) more fake, (b) more inaccurate, and (c) more financially motivated.

RQ2: What are the interaction effects between source attribution and issue extremity on participants' evaluations of (a) perceived news fakeness, (b) perceived inaccuracy, and (c) financial motivation?

An online experiment was conducted in Hong Kong in March 2019. Participants were recruited through an online panel of a private company, Dynata (previously known as SSI). A total of 135 participants aged 18 years or older were recruited by the company and were paid for their participation. They were exposed to a fabricated Facebook news post claiming that milk consumption can cause cancer. The sample had 77 females (57.0%) and an average age of 29.96 years ($SD = 12.75$), ranging from 18 to 70 years old. Overall, around 29% of the sample reported holding a secondary school degree, 63% a college degree, and 8% a graduate degree. While 28.1% reported having a monthly family income below HKD 10,000, 12.6% reported having a monthly income of HKD 10,001–30,000, 34.8% between HKD 30,001–50,000, and 24.4% above HKD 50,000.

The experiment involved a 2-cell (news source: legacy news outlet vs. unfamiliar online health source) experimental design. Participants were randomly assigned to one of the two conditions. While 68 participants (50.4%) read a post published by a legacy news outlet, TOPick, 67 (49.6%) read a post published by an unfamiliar online health website, the China Health website. A manipulation check was performed to ensure that significantly more participants had heard of the legacy news outlet than the foreign health website at the .001 significance level. For both conditions, the content of the fake Facebook post was identical, created using existing controversial findings regarding milk consumption. To ensure internal validity, it was verified that the content's flow, the post layout, the date and time when the story was published, and the length of the post were all consistent across conditions. Regarding external validity, the design of the Facebook post replicated the layout of Facebook posts published by both TOPick and the China Health website.

Measurements

Perceived inaccuracy: Using a 7-point Likert scale from 1 (totally disagree) to 7 (totally agree), participants were asked to report to what extent they thought the news they had just read (a) exaggerated the harmfulness of milk, (b) involved misleading content, (c) did not present the whole story, and (d) involved serious mistakes. The mean of all four items was calculated to measure perceived inaccuracy ($M = 4.57$, $SD = .96$, Cronbach's $\alpha = .90$).

Perceived intent: Participants reported the extent to which they thought the news they had just read was written for financial gain using a 7-point Likert scale from 1 (totally disagree) to 7 (totally agree) ($M = 3.64$, $SD = 1.42$).

Perceived fakeness: Participants were asked to indicate to what extent they thought the news they had just read was (a) made up and (b) fake using a 7-point Likert scale from 1 (totally disagree) to 7 (totally agree). The mean of the two items was calculated ($M = 4.17$, $SD = 1.03$, Cronbach's $\alpha = .93$).

Prior health beliefs: To create two groups holding different prior views on milk consumption, participants were asked whether people should consume milk frequently on a scale of 1 (definitely not) to 5 (absolutely), with 3 (neither yes nor no) as a mid-point ($M = 3.63$, $SD = .72$). Those who reported 1 (definitely not), 2 (maybe not), and 3 (neither yes nor not) were categorized as anti-milk participants ($n = 53$), while those who reported 4 (maybe yes) and 5 (definitely) were categorized as pro-milk participants ($n = 82$).

RESULTS

Prior to testing the hypotheses and research questions, tests of normality of the three core variables as well as the correlations among them were reported to ensure the appropriate statistical tests

were performed and that they were not highly linearly related (see Table 1). According to the Kolmogorov-Smirnov Tests, normal distributions of the variables were not present. As shown in Table 1, Spearman's correlation coefficients between perceived news fakeness and perceived inaccuracy ($\rho = .64, p < .001$), perceived news fakeness and perceived financial intent ($\rho = .39, p < .001$), as well as inaccuracy and intent ($\rho = .23, p = .009$), the three variables were only lowly or moderately related to each other. Hence, the three variables were found to be independent from each other.

Source and Prior Health Beliefs

A two-way analysis of covariance was performed with perceived fakeness, perceived inaccuracy, and perceived financial intent as the criterion variable, respectively, to explore the main effects of source (RQ1), main effects of prior health belief (H2), and interactive effects of source and prior health belief (RQ2). Covariates in the analyses included gender, age, education, and income.

With respect to RQ1, main effects of source on perceived fakeness ($F(1, 127) = 1.38, p = .243$), perceived inaccuracy ($F(1, 127) = .01, p = .938$), and perceived financial intent ($F(1, 127) = 2.21, p = .139$) were not found (see Table 2). Nonetheless, main effects of prior health belief were found in relation to all three outcomes: perceived fakeness ($F(1, 127) = 11.24, p = .001, \eta = .08$), perceived inaccuracy ($F(1, 127) = 8.9, p = .003, \eta = .07$), and perceived financial intent ($F(1, 127) = 14.32, p < .001, \eta = .10$). Given that normal distributions could not be assumed, Welch tests were also performed to confirm the validity of the main effects found. Similar patterns surface: perceived fakeness (Welch's $F(1, 119.38) = 12.76, p = .001$), perceived inaccuracy (Welch's $F(1, 113.33) = 9.13, p = .003$), and perceived financial intent (Welch's $F(1, 100.81) = 17.79, p < .001$). H2 is, therefore, supported. In general, pro-milk participants exposed to a piece of conflicting news (anti-milk) rated the news content as more fake ($M = 4.41, SD = 1.02$) than anti-milk participants did ($M = 3.80, SD = .92, p = .001$). Similarly, pro-milk participants saw the anti-milk news as more inaccurate ($M = 4.76, SD = .94$) and financially motivated to a greater extent ($M = 4.04, SD = 1.26$) than anti-milk participants did ($M = 4.27, SD = .91, p = .003$; $M = 3.02, SD = 1.43, p < .001$, respectively), suggesting that they employed motivated reasoning.

Interaction Effects

Further, the interaction terms were found to be significant with respect to all three variables (see Figure 1). In other words, source and prior health belief interacted significantly on perceived news fakeness ($F(1, 127) = 11.30, p = .001, \eta = .08$), perceived inaccuracy ($F(1, 127) = 5.15, p = .025, \eta = .04$), and perceived financial intent ($F(1, 127) = 4.22, p = .042, \eta = .03$). Pairwise comparisons adjusted using the Bonferroni method suggested that pro-milk participants ($M = 4.63, SD = 1.05$) rated the anti-milk website as more fake than the anti-milk participants did ($M = 3.50, SD = .89, p < .001$). Similar patterns were found with respect to perceived inaccuracy and perceived financial motive. While pro-milk participants ($M = 4.99, SD = .99$) rated the anti-milk website as more inaccurate than the anti-milk participants did ($M = 4.16, SD = 1.04, p < .001$), the pro-milk participants ($M = 4.05, SD = 1.49$) rated the anti-milk website as more financially motivated than anti-milk participants ($M = 2.69, SD = 1.23, p < .001$). In this sense, the main effects of prior health belief mainly were driven by those exposed to an unfamiliar online source (China Health website) rather than a familiar local source (TOPick).

Underlying Mechanism

Finally, the expected mediation was found to be significant at the .05 level, according to the 95% confidence interval of the indirect effects obtained with 5,000 bootstrapping samples (22). In other words, perceived intent was found to mediate the relationship between perceived inaccuracy and perceived fakeness (Effect = .06, SE = .03, CI = .006–.134). H1 is, therefore, supported.

DISCUSSION

Health information intake has always been a topic deserving serious investigation because it is likely to impact how individuals form attitudes, behave, and make policy decisions (Davies & Horst, 2016). Given the growing circulation of information on the Internet (Tambuscio et al., 2015), ordinary citizens no longer solely rely on mass media for their health information. Instead, they are now exposed to a diversity of health information sources, including unfamiliar media sources, such as health websites, blogs, or Facebook pages. Prior to developing interventions for health promotion, scholars must understand how people decide what health information to trust and ignore.

The findings of this study suggest that rather than the source, the most important factor in influencing a fakeness assessment of health news might be prior beliefs. Thus, practitioners involved in enhancing citizens' digital literacy as well as health promotion should devote more effort to overcoming challenges brought by motivated reasoning, in which people tend to process information that confirms their personal health beliefs. Once individuals adopt a belief or behavior, they are likely to accept confirmatory information at face value while rejecting information that contradicts their existing beliefs or actions (Lord et al., 1979). This is particularly important when it comes to disseminating health information to audience through a source that they find unfamiliar. When exposed to a relatively unfamiliar news source, gaps between anti-milk and pro-milk participants were found in relation to perceived fakeness, inaccuracy, and intent. In general, the two groups of participants perceived the exact same content as significantly different, with pro-milk participants exposed to an incongruent piece of health content (anti-milk) rating the material to be more inaccurate, financially motivated, and fake than anti-milk participants who were exposed to attitude-consistent content did.

The findings further indicate that the gaps regarding perceived intent and fakeness were mainly contributed by anti-milk participants who read a belief-consistent news post. These participants, when exposed to confirming information, rated the unfamiliar source as less motivated by financial gain and less fake than a familiar legacy news source. In other words, among individuals who were exposed to congruent health content, they were more likely to trust the unfamiliar website than the legacy outlet. Thus, if source is said to play a role, people tend to view legacy news media as venues that aim to make money from their readers. Such results imply that audience are more likely to perceive a legacy news outlet as playing a role in gaining advertising revenue, probably through sponsored advertisements and embedded marketing posts. This makes sense also because advertisers do have a tendency to aim for a larger reach by advertising through a legacy outlet, at least from the audience's perspective. In this case, people might become more skeptical of information published by a legacy source.

Finally, consistent with what the advertising literature (Campbell, 1995) suggests, this study found evidence that a perception of manipulative intent (i.e., pursuit of financial gain) can drive audience to resist health content. As the perceived intent is emphasized, the findings speak not only to misinformation but also to disinformation. While the perceived inaccuracy of news can be seen as the foundation of disinformation, the perceived intent behind its publication and dissemination bridges the relationship between perceived inaccuracy and perceived fakeness. Such findings suggest the importance of being aware that readers think about the possible intentions behind a piece of information. Future studies should investigate other possible motives underlying a health publication.

Implications

To better promote digital literacy or disseminate health information, such as new health findings, practitioners should be aware that individuals' prior health beliefs will likely play a big role in the processing of that piece of information. In particular when the health findings or recommendations

are attached to one's political views, motivated reasoning is expected to play a major role in one's reception of health information. For instance, news on COVID-19 was often highly political, and people are therefore anticipated to process related information in ways that comply with their political predispositions. As a result, some are likely to trust false health news and in turn commit to ill-advised behaviours.

Further, people are often taught to note the source of news content. According to factcheck.org (Kiely & Robertson, 2016), media audience are encouraged to consider whether there is a source, who the source is, and whether the source is likely to be biased. Such a strategy might not be helpful, as motivated reasoning can sometimes be activated unconsciously, and people are influenced by their personal beliefs without being aware of it (Tsang, 2019b). Practically, it might be better to disseminate health information via a source that is known to be non-profit than legacy news media, at least among people who do not hold a strong belief about the health topic of concern.

Given that perceived intent is found to mediate the relationship between perceived inaccuracy and fakeness, organizations responsible for disseminating health information should make an effort to build a positive image, such that they would not be seen as driven by any kinds of malicious intent. Take the COVID-19 pandemic as an example again, given the highly polarized context, health organizations or media organizations publishing health information were often accused to be either financially (i.e., publish certain contents to receive funding from a specific agency) and/or politically (i.e., publish biased information as instructed by specific politicians) motivated. These accusations would slowly deteriorate public trust toward both health and media organizations, and impair health system responses in a pandemic when true information is misperceived to be false and when false information seen to be accurate.

Limitations

This study was not without limitations. There is evidence that motivated perceptions of health news are present in Hong Kong, but researchers should continue to replicate such findings in other regions and countries. In addition, as this study was conducted in one health context (i.e., milk consumption), the research should be extended to various health contexts, such as vaccinations and chronic health conditions.

CONCLUSION

It is vital to consider how audience make sense of health information in the digital era. This was a pioneering study, as it yielded empirical evidence of how people assess the fakeness of health news online. From an audience perspective, what contributes to perceived fakeness is not just the perception of inaccurate content but also the perceived intent of the story. Since people do not interpret and assess fabricated information in a straightforward manner, the results of this study emphasize the importance of taking motivated reasoning into account when creating health education programs and interventions.

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Table 1. Descriptive statistics and correlations among all main variables

	Perceived inaccuracy	Perceived intent	Perceived fakeness
M (SD)	.57 (.96)	3.64 (1.42)	4.17 (1.03)
Skewness (SE)	.08 (.21)	.03 (.21)	.24 (.21)
Kurtosis (SE)	1.09 (.41)	-.16 (.41)	1.05 (.41)
Kolmogorov-Smirnov Test	.14***	.21***	.23***
Perceived inaccuracy	-		
Perceived intent	.23**	-	
Perceived fakeness	.64***	.39***	-

Note. *** $p < .001$, * $p < .01$.

Table 2. Descriptive statistics for perceived inaccuracy, financial motive and fakeness by information source and prior health belief

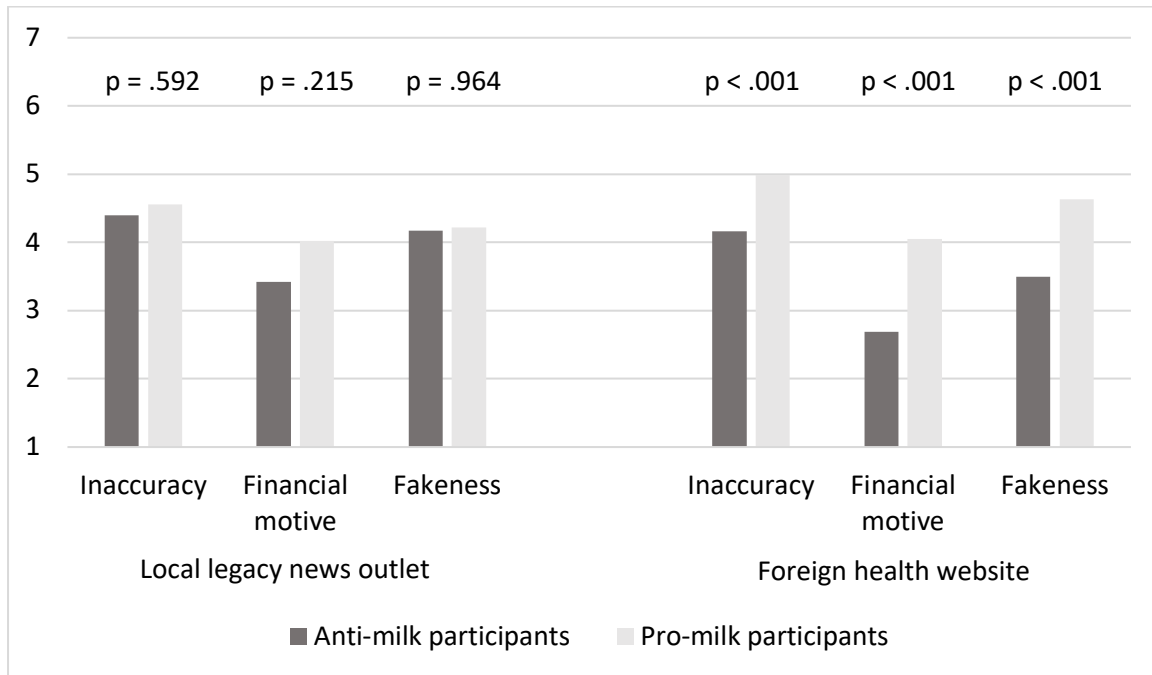
	Local legacy news outlet	Foreign health website	Total	
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>F (df1, df2)</i>
Perceived inaccuracy				
Anti-milk participants	4.40 (.74) ^c	4.16 (1.04) ^{a, c}	4.27 (.91) ^b	5.15* (1, 127)
Pro-milk participants	4.56 (.86)	4.99 (.99) ^a	4.76 (.94) ^b	
Total	4.50 (.81)	4.63 (1.08)	4.57 (.96)	
Perceived financial intent				
Anti-milk participants	3.42 (1.59)	2.69 (1.23) ^d	3.46 (1.53) ^e	4.22* (1, 127)
Pro-milk participants	4.02 (1.05)	4.05 (1.49) ^d	3.81 (1.28) ^e	
Total	3.81 (1.28)	3.46 (1.53)	3.64 (1.42)	
Perceived news fakeness				
Anti-milk participants	4.17 (.84) ^h	3.50 (.89) ^{f, h}	3.80 (.92) ^g	11.30** (1, 127)
Pro-milk participants	4.22 (.97)	4.63 (1.05) ^f	4.41 (1.02) ^g	
Total	4.20 (.92)	4.14 (1.13)	4.17 (1.03)	

** $p < .01$, * $p < .05$.

F-statistics for the interaction between news source and prior health belief are reported, controlling for age, gender, education, and income.

^{a-f} Mean is statistically different from the mean of the relevant comparison group indicated by the same letter.

Figure 1. Mean differences and significance between pro-milk and anti-milk participants when exposed to an anti-milk news story



Note: While 4 represents “neither disagree or agree,” 1 represents “disagree totally” and 7 represents “agree totally.”

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