

## A STUDY OF CONSUMER RESPONSE TO FAKE NEWS ABOUT BRANDS ON SOCIAL MEDIA: THE EFFECTS OF MEDIA TRUST, CONFIRMATION BIAS, AND PERSUASION KNOWLEDGE ON BRAND TRUST

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### Abstract

*This study, "A study of consumer response to fake news about brands on social media: the effects of media trust, confirmation bias, and persuasion knowledge on brand trust," set out to determine how common fake news is on social media, how it affects media trust, whether consumers are affected by confirmation bias when they consume fake news, whether consumers can counteract fake news with persuasion knowledge, whether confirmation bias affects persuasion knowledge, and how these factors combine to affect brand trust overall. A survey was conducted among social media users in India. This paper contains the results of a pilot study that was carried out prior to the major research project.*

*Keywords: Fake news; Media trust; Consumer bias; Persuasion knowledge; Brand trust.*

### Introduction

A research titled "A study of consumer response to fake news about brands on social media: the effects of media trust, confirmation bias, and persuasion knowledge on brand trust" was undertaken with the objectives of assessing the levels of presence of fake news on social media, evaluating the impact of fake news on media trust, finding out if consumers are impacted by confirmation bias while consuming fake news, studying if consumers can combat fake news through persuasion knowledge, finding out if confirmation bias has an impact on persuasion knowledge, and analyzing the overall impact of media trust, confirmation bias, and persuasion knowledge on brand trust. Users of social media across India were surveyed.

Before the main research was undertaken a pilot study was conducted and the details are stated in this report.

#### Objectives of the pilot study

- To get a feel of issues encountered in data collection
- To test the usage of the questionnaire
- To test the hypotheses as per research methodology
- To test validity and reliability of questionnaire prepared for primary data collection

### Literature review

Allcott & Gentzkow (2017) observe that after the 2016 US presidential election, many expressed concern about the effects of fake news ("fake news"), which was spread largely through social media. Authors discuss the economics of fake news and present new data on its consumption before the election. Based on web browsing data, fact-checking website archives, and the results of a new

online survey, authors find: 1) social media was an important but not dominant source of election news, with 14 percent of Americans naming social media as their "biggest" source. important" source; 2) of the known fake news stories that appeared in the three months before the election, those supporting Trump were shared a total of 30 million times on Facebook, while those supporting Clinton were shared 8 million times; 3) the average adult American saw on the order of one or perhaps several fake news stories in the months surrounding the election, with slightly more than half of those who recalled seeing them believing them; and 4) people are much more likely to believe stories that favor their preferred candidate, especially if they have ideologically separate social networks.

Waszak et al. (2018) state that fake news: misinformation and false health reports on social media pose a potential threat to public health, but the extent of the problem remains unclear. The pilot study is the first attempt to measure a number of the most frequently shared misinformation stories about health in Polish social media. Using the BuzzSumo application, a number of the main shared health web links in Polish social media were evaluated between 2012 and 2017. Authors used the following keywords that related to the most common diseases and causes of death: cancer, neoplasm, heart attack, stroke, hypertension, diabetes, vaccination, HIV and AIDS. Each link has been checked for fake news. 40% of the most frequently shared links contained text that authors classified as fake news. These have been shared more than 450,000 times. The most misleading content was about vaccines, while news about cardiovascular disease was generally well-accessible and informative. More than 20% of the dangerous links in our material were generated by a

single source. An analysis of the top messages shared on social networks could help identify the leading false medical information that misleads society. It could also encourage authorities to take measures such as placing warnings on biased domains or scientifically evaluating those who generate fake health reports.

Aimeur et al. (2023) state that online social networks (OSN) are growing rapidly and have become a huge source of all kinds of global and local news for millions of users. However, the UN is a double-edged sword. Although they offer great advantages such as unlimited easy communication and instant messages and information, they can also have many disadvantages and problems. One of their main problems is the spread of fake news. Identifying fake news is still a complex unsolved problem. In addition, detecting fake news at the UN presents unique characteristics and challenges that make finding a solution anything but trivial. On the other hand, artificial intelligence (AI) approaches are still unable to overcome this challenging problem. To make matters worse, artificial intelligence techniques such as machine learning and deep learning are being used to deceive people by creating and spreading fake content. As a result, the automatic detection of fake news remains a huge challenge, mainly because the content is designed to resemble the truth as much as possible, and its veracity is often difficult to determine by AI alone without additional information from third parties. This work aims to provide a comprehensive and systematic review of fake news research as well as a basic overview of existing approaches used to detect and prevent the spread of fake news through the UN. Authors present the research problem and existing challenges, discuss the state of the art in existing approaches to fake news detection, and point to future research directions in addressing these challenges.

Moravec et al. (2018) observe that fake news (i.e. disinformation) on social networks has increased sharply in recent years. Authors conducted an experiment collecting behavioral and EEG data from 83 social media users to understand whether they can detect fake news on social media and the factors influencing cognition and judgment. Authors found that confirmation bias dominates, with most users unable to distinguish between real and fake news. Users show greater cognitive activity when news headlines match their political views and are more likely to believe them. Headlines that challenge their views have little cognitive activity (i.e. are ignored) and users are less likely to believe them. The presence of fake news labels in the headline in line with users' opinions triggered cognitive activity that could be

associated with increased semantic memory retrieval, false memory construction, or increased attention. However, this flag had no effect on judgments of truth; marking headlines as false did not affect users' beliefs. Only 17% of our participants were better than chance at detecting fake news, with only one detecting fake news more than 60% of the time. In other words, most social media users would be better off judging the truth with a coin toss.

On similar lines 120 items of literature were reviewed. However, most of the research is in non-Indian context. Indian studies compared to their foreign counterpart are very few in numbers. Moreover, a study integrating these concepts is not seen on record. How fake news on social media impacts media trust, what is the role of confirmation bias and persuasion knowledge, and ultimately how these variables impact brand trust, has not been studied.

## Methodology

### Approach

The responses of the sample are in the form of opinions and views, which is primarily a non-numeric, and qualitative data which was obtained on a Likert scale. However, due quantitative methods were employed to test various hypotheses and reach objective conclusions.

### Population and Sample

Population of social media users can be easily estimated to be a large population (in excess of 20,000 – a threshold considered as a large population).

Sample size was calculated using Cochran formula which is as under:

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where:

- e is the desired level of precision (i.e. the margin of error),
- p is the (estimated) proportion of the population which has the attribute in question,
- q is 1 – p.

The z-value is found from the Z table and it is 1.96. e, that is the desired level of precision is 0.05 p, (estimated) proportion of the population which has the attribute in question is 50%, i.e, 0.5 and q is 1 – 0.50 = 0.50

Putting these values in the formula we get:  $((1.96)^2 (0.5) (0.5)) / (0.05)^2 = 385$  which was rounded off to 400 for ease of calculations.

For the pilot study, 25% of the main studies sample size, that is, 100 social media users was considered.

### Instrument for survey

For the survey an elaborate questionnaire was designed. It contained 5 sections in addition to the profile information part. Each section had multiple statements and responses were sought on a 5-point Likert scale. As suggested by Menold and Bogner (2016) a DK (Don't Know) filter was used for the responses and Cannot Say option was placed as the first response option to allow an early exit for those respondents who are unsure of their response. This helped collection of more valid responses. The questions framed were largely grounded on literature. Some examples of the literature referred are Shu et al. (2017), Domenico et al. (2021), Aldwairi & Alwahedi (2018).

The questionnaire was tested for validity and reliability as under –

*Test of validity*

The hypotheses, hypotheses testing method, questionnaire etc. were validated by the Guide and other experts in the field so as to ensure that the measurement was adequate and accurate in terms of the desired direction. During this process some questions from the questionnaire were found to be lacking adequate relevance and hence were removed from the questionnaire.

A check-list as prescribed by Brown et al. (2015) was applied for validation as under:

**Table 1: Application of Brown et al. check-list for validation**

Step No.	Step	Action
1	Establish Face Validity	The questionnaire has been validated for face validity by guide and group of experts.
2	Clean Collected Data	The mechanism of collecting data ensured that there was no invalid entry because the entry was through selection from options from the Google Forms.
3	Check Internal Consistency	This was done through Cronbach's Alpha

*Test of reliability*

Cronbach's Alpha test was applied on the questionnaire using "Siegle Reliability Calculator" an excel program. The Cronbach's alpha score table is given below:

**Table 2 : Cronbach alpha scores of the questionnaire (pilot study data)**

Sr. No.	Section	Cronbach alpha score
1	Section I – Levels of fake news	0.961
2	Section II – Media trust	0.919
3	Section III – Confirmation bias	0.753
4	Section IV – Persuasion knowledge	0.907
5	Section V – Brand trust	0.786
	Entire questionnaire	0.874

As the Cronbach's alpha score was more than 0.70, the questionnaire was considered reliable.

*Hypotheses formulation*

Based on the purpose and the scheme of variables following scheme of hypotheses formulation emerged:

Ho1 – The levels of fake news on social media are moderate

Ha1 – The levels of fake news on social media are high

Ho2: There is no impact of fake news on media trust

Ha2: There is an impact of fake news on media trust

Ho3 – Consumers are not impacted by confirmation bias while consuming fake news

Ha3 – Consumers are impacted by confirmation bias while consuming fake news

Ho4 – Consumers are able to combat fake news through persuasion knowledge

Ha4 – Consumers are not able to combat fake news through persuasion knowledge

Ho5 - Confirmation bias has no impact on persuasion knowledge

Ha5 – Confirmation bias has an impact on persuasion knowledge

Ho6 – There is no impact of media trust, confirmation bias, and persuasion knowledge on brand trust

Ha6 - There is an impact of media trust, confirmation bias, and persuasion knowledge on brand trust

Ho7 - There is no impact of demographic variables on consumption of fake news on social media

Ha7 - There is an impact of demographic variables on consumption of fake news on social media

*Scheme formed for testing of hypotheses*

- Weights of 2 were used to value extreme (strongly) responses and distinguish them from moderate (somewhat) responses

- Average agreement/disagreement score for each of the sections was calculated for all the 10 sub-responses under each of them for the respondents
- The 1<sup>st</sup> hypothesis was tested using a t-test, by comparing the average agreement/disagreement scores (average of 10 sub-responses) with a hypothesized population mean of 50% agreement/disagreement, connoting an event by chance
- A t-test was used since the standard deviation of the population was unknown
- The remaining six hypotheses were tested through regression analysis
- In case of 2<sup>nd</sup> hypothesis, level of fake news was taken as the independent variable while media trust was taken as the dependent variable
- In case of 3<sup>rd</sup> hypothesis, level of fake news was taken as the independent variable while confirmation bias was taken as the dependent variable
- In case of 4<sup>th</sup> hypothesis, level of fake news was taken as the independent variable while persuasion knowledge (combating of fake news through persuasion knowledge) was taken as the dependent variable
- In case of 5<sup>th</sup> hypothesis, level of confirmation bias was taken as the independent variable while persuasion knowledge (combating of fake news through persuasion knowledge) was taken as the dependent variable
- In case of 6<sup>th</sup> hypothesis, media trust, confirmation bias, and persuasion knowledge were taken as the independent variables while brand trust was taken as the dependent variable
- In case of 7<sup>th</sup> hypothesis, the demographic variables were taken as the independent variables while level of fake news was taken as the dependent variable. ANOVA was used to test the impact.
- For the purpose of regression analysis the responses were valued as 0 for Cannot say, 1 for Somewhat agree, 2 for Strongly agree, -1 for Somewhat disagree, and -2 for Strongly disagree

- All the hypotheses were tested at 95% confidence level, that is, alpha for p-value was set at 0.05.

**Data analysis**

**Profile information**

The following table summarizes the profile information of the 100 respondents of the pilot study:

**Table 3: Demographic profile of the 100 respondents**

Sr. No.	Variable	Categories	Frequency	%
1	Region	North	21	21%
		East	19	19%
		West	35	35%
		South	25	25%
2	Gender	Male	45	45%
		Female	55	55%
3	Age	< 30 years	18	18%
		30-39 years	28	28%
		40-49 years	35	35%
		>= 50 years	19	19%
4	Occupation	Student	12	12%
		Job	32	32%
		Business	23	23%
		Retired	17	17%
		Homemaker	16	16%
5	Social media platform used predominantly	Facebook	4	4%
		Twitter	10	10%
		Instagram	16	16%
		Whatsapp	16	16%
		Other	10	10%
6	Since how many years active on social media	<3 years	8	8%
		3-5 years	52	52%
		>5 years	40	40%
7	Average daily time spent on social media	<1 hour	16	16%
		1-3 hour	68	68%
		> 3 hours	16	16%

**Testing of hypotheses**

Ho1 – The levels of fake news on social media are moderate

Ha1 – The levels of fake news on social media are high

This hypothesis was tested based on the agreement/disagreement responses to Section I of the questionnaire, which are summarized in the table give below:

**Table 4: Agreement percentages to Section I of the questionnaire**

Qstn.	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	1.10	Average
Agree %	85%	86%	81%	82%	89%	82%	81%	86%	87%	81%	84%

The average agreement was then compared with a hypothesized population mean of agreement of

50% using a t-test, and the results are summarized in the table given below:

**Table 5: Testing of H1**

Parameter	Values
Sample Mean ( $\bar{x}$ )	84%
SD of sample	0.90531
Hypo. population mean ( $\mu$ )	50%
N	100
t-value	3.74
p-value	<0.0001

Since the p-value was <0.05, the first null hypothesis, the levels of fake news on social media are moderate was rejected in favor of its alternate, the levels of fake news on social media are high.

Ho2: There is no impact of fake news on media trust

Ha2: There is an impact of fake news on media trust

This hypothesis was tested using regression analysis taking media trust as the dependent variable and level of fake news as the independent variable. The regression results are given below:

**Table 6: Summary of regression results – H2**

Parameter	Values
Mean – Level of fake news	1.019
SD (Standard Deviation)	1.130
Mean – Media trust	1.005
SD (Standard Deviation)	0.997
n (Sample Size)	100
R <sup>2</sup>	83.50%
F value	495.62
p-value	<0.0001

Since the p-value was <0.05, the second null hypothesis, there is no impact of fake news on media trust was rejected in favor of its alternate, there is an impact of fake news on media trust.

Ho3 – Consumers are not impacted by confirmation bias while consuming fake news

Ha3 – Consumers are impacted by confirmation bias while consuming fake news

This hypothesis was tested using regression analysis taking confirmation bias as the dependent variable and level of fake news as the independent variable. The regression results are given below:

**Table 7: Summary of regression results – H3**

Parameter	Values
Mean – Level of fake news	1.019
SD (Standard Deviation)	1.130
Mean – Confirmation bias	0.289
SD (Standard Deviation)	0.803
n (Sample Size)	100
R <sup>2</sup>	69.30%
F value	221.600
p-value	<0.0001

Since the p-value was <0.05, the third null hypothesis, consumers are not impacted by confirmation bias while consuming fake news was rejected in favor of its alternate, consumers are impacted by confirmation bias while consuming fake news.

Ho4 – Consumers are able to combat fake news through persuasion knowledge

Ha4 – Consumers are not able to combat fake news through persuasion knowledge

This hypothesis was tested using regression analysis taking persuasion knowledge as the dependent variable and level of fake news as the independent variable. The regression results are given below:

**Table 8: Summary of regression results – H4**

Parameter	Values
Mean – Level of fake news	1.019
SD (Standard Deviation)	1.130
Mean – Persuasion knowledge	-1.035
SD (Standard Deviation)	0.998
n (Sample Size)	100
R <sup>2</sup>	84%
F value	515.151
p-value	<0.0001

Since the p-value was <0.05, the fourth null hypothesis, consumers are able to combat fake news through persuasion knowledge was rejected in favor of its alternate, consumers are not able to combat fake news through persuasion knowledge.

Ho5 - Confirmation bias has no impact on persuasion knowledge

Ha5 – Confirmation bias has an impact on persuasion knowledge

This hypothesis was tested using regression analysis taking persuasion knowledge as the dependent variable and confirmation bias as the independent variable. The regression results are given below:

**Table 9: Summary of regression results – H5**

Parameter	Values
Mean – Confirmation bias	0.289
SD (Standard Deviation)	0.803
Mean – Persuasion knowledge	-1.035
SD (Standard Deviation)	0.998
n (Sample Size)	100
R <sup>2</sup>	77.1%
F value	330.231
p-value	<0.0001

Since the p-value was <0.05, the fifth null hypothesis, confirmation bias has no impact on persuasion knowledge was rejected in favor of its

alternate, confirmation bias has an impact on persuasion knowledge.

Ho6 – There is no impact of media trust, confirmation bias, and persuasion knowledge on brand trust

Ha6 - There is an impact of media trust, confirmation bias, and persuasion knowledge on brand trust

This hypothesis was tested through a multiple regression analysis wherein brand trust was taken as the dependent variable and media trust, confirmation bias, and persuasion knowledge, were taken as the independent variables. The regression results are given below:

**Table 10: Summary of regression results – H6**

Parameter	Values
Mean – Media Trust	1.005
SD (Standard Deviation)	0.997
Mean – Confirmation bias	0.289
SD (Standard Deviation)	0.803
Mean – Persuasion knowledge	-1.035
SD (Standard Deviation)	0.998
Mean – Brand trust	0.366
SD (Standard Deviation)	0.796
n (Sample Size)	100
R <sup>2</sup>	77.4%
F value	109.559
p-value	<0.0001

Since the p-value was <0.05, the sixth null hypothesis, there is no impact of media trust, confirmation bias, and persuasion knowledge on brand trust was rejected in favor of its alternate, there is an impact of media trust, confirmation bias, and persuasion knowledge on brand trust.

Ho7 - There is no impact of demographic variables on consumption of fake news on social media

Ha7 - There is an impact of demographic variables on consumption of fake news on social media

This hypothesis was tested using ANOVA taking levels of fake news as the dependent variable and demographic variables (zone, gender, age, occupation, predominant platform of SM, period since using SM, and average daily time spent on SM) as the independent variables. The ANOVA results are given below:

**Table 11: Summary of regression results – H7**

Parameter	Values
Mean – Level of fake news	1.019
SD (Standard Deviation)	1.130
n (Sample Size)	100
R <sup>2</sup>	19.40%
F value	0.953
p-value	0.525

Since the p-value was >0.05, the seventh null hypothesis, there is no impact of demographic

variables on consumption of fake news on social media could not be rejected in favor of its alternate, there is an impact of demographic variables on consumption of fake news on social media.

**Conclusion**

The levels of fake news on social media are high. There is an impact of fake news on media trust. Consumers are impacted by confirmation bias while consuming fake news. Consumers are not able to combat fake news through persuasion knowledge. Confirmation bias has an impact on persuasion knowledge. There is impact of media trust, confirmation bias, and persuasion knowledge on brand trust. There is no impact of demographic variables on consumption of fake news on social media.

In case of pilot study following conclusions were drawn:

- a) Data collection is possible with reasonable comfort
- b) Processing of the data into variables required for inferential data analysis can be done
- c) The hypotheses can be duly tested as per research methodology
- d) The questionnaire prepared for primary data collection tests well for validity and reliability. However, respondents demanded confidentiality.

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