Conspiracy Theories and Misinformation

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Motivation

As the influence of social media expands, concerns with misinformation spreads along side it. Recent studies have shown that many Americans struggle to differentiate real information from misinformation (Pennycook, 2021). Through this misinformation, conspiracy theories have become an everyday phenomenon.

Conspiracy theories are not a new concept and many date back far before the popularization of social media. However, in the last decade, political conspiracy theories have spread to the medical field, climate change, sports, the economy, and many other facets of our society.

In this experiment, we want to study if exposure to misinformation on social media impacts someone's willingness to believe a conspiracy theory.

Literature Review

The Ipsos Misinformation and Conspiracy Theory Poll (Ipsos, 2022), conducted in December 2021 and released in January 2022, surveys a representative sample of the US adult population. It finds that 32 percent of Americans consider the spread of false information to be a top-three most worrisome issue for the United States, but also that only 25 percent of respondents could correctly answer all 10 of a set of questions about recent events that have inspired conspiracy theories. Given the central role of social media in today's conspiracy theory culture, this state of simultaneous widespread concern about and limited acuity at distinguishing truths from falsehoods (Pennycook, 2021) emphasizes the need for expanding our knowledge of how strongly exposure to conspiracy theorist ideas on social media, versus exposure to correct information, influences persons' likelihood of endorsing conspiracy theories.

Hypothesis 1: Exposure to misinformation will lead to an increase in belief in conspiracy theories.

Hypothesis 2: Participants who are more right-leaning are more likely than those of other political orientations to believe conspiracy theories

Research Design

- Research Design: Between subject design with control group
- Research method: Survey Experiment
- Independent Variable: Exposure to misinformation on a popular social media platform.
- Dependent Variable: Willingness to believe a conspiracy theory
- Treatments: Exposure to true source vs. Exposure to conspiracy
- Moderator: Party Identification

Participants in Treatment group 1 were exposed to a manipulated social media post containing misinformation related to a popular conspiracy theory (Roswell), while participants in Treatment group 2 were exposed to a social media post with the correct information about the conspiracy theory. The control group was not exposed to any information about the conspiracy theory. All participants (who have been exposed to different types of treatments) were asked if they agree or disagree with each of the following explanations: the factual explanation of the event, the conspiratorial explanation of the event, and an unspecified other explanation that is different from the factual and conspiratorial explanation. We used a 5-point Likert scale for these questions. The control group was asked these questions with no story attached.

Roswell: The Roswell incident of 1947 in New Mexico, USA is a famous event because of the the conspiracy theories surrounding it. During this event, The United States Air Force at first discovered what they called a crashed "unidentified object". After analyzing what they found, the Air Force concluded that the crashed object was a weather balloon. Although this information has been around for quite some time and is from a credible source, many people have come up with conspiracy theories about what actually crashed in Roswell.
We decided to use the Roswell story as our treatment manipulation because it is a familiar story to the public and is apolitical. The detailed truth of this story is not well known by the general public, which makes it a good example for manipulation.

	Control group	Treatment group 1	Treatment group 2
Precheck question to see how familiar the respondents are with the Roswell Story	Yes	Yes	Yes
Exposure to misinformation	No	Yes	No
Exposure to True information	No	No	Yes
Questions asking respondents to choose if they agree or disagree between each of the explanations	Yes (No story attached, n=15)	Yes (False story attached, n=17)	Yes (True Story Attached,n=13)
Party ID question	Yes	Yes	Yes
Demographic questions & social media usage	Yes	Yes	Yes

Members of Treatment Group 1 were exposed to this Tweet (False)

Members of Treatment Group 2 were exposed to this Tweet (True)

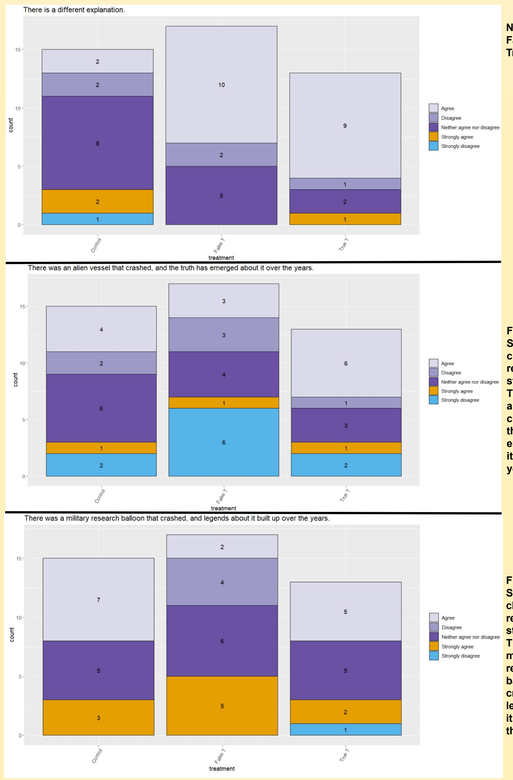
Data

We created our survey using Qualtrics. Our survey was then distributed to respondents, who were compensated, through mTurk. After about a day of being live, we were able to receive 259 responses. We decided to remove any responses that had a Recaptcha score less than 0.5 and a Relevant ID Fraud score greater than 30. These two metrics evaluate the likelihood of a response being a bot, so checking for these thresholds is essential for having quality data. We also parsed out any data instances that shared the same geo-coordinates.

After cleaning up our data, we were left with 45 survey responses.

Results

For our analysis, we decided to use One-Way Anova to test for significance, linear regression to test for significance of Party Id for agreeing with the conspiracy, and stacked bar charts to visualize our results.



Note: Control = Control Group
False T = False Treatment Group
True T= True Treatment Group

Figure 1: Stacked Bar chart of responses for statement: There is a different explanation.

Figure 2: Stacked Bar chart of responses for statement: There was an alien vessel that crashed, and the truth has emerged about it over the years.

Figure 3: Stacked Bar chart of responses for statement: There was a military research balloon that crashed, and legends about it built up over the years.

Anova Results:

Statement	Variable	DF	Sum Sq.	Mean Sq.	F statistic	P-value
There is a different explanation.	treatment (Control,False, True)	2	2.835	1.4174	1.966	0.153
There was an alien vessel that crashed, and the truth has emerged about it over the years.	treatment (Control,False, True)	2	5.49	2.743	1.778	0.18
There was a military research balloon that crashed, and legends about it built up over the years.	treatment (Control,False, True)	2	1.38	0.6892	0.67	0.517

Linear Regression Results:

Coefficient	Effect	Estimate	Std. Error	T value	P-value
poliIDRepublican	Main Effect	1.4764	0.4012	3.680	0.000688
treatmentFalseT:poliIDRepublican	Interaction Effect	0.27143	0.97536	0.278	0.782

After completing the One-Way Anova test for significance and analyzing the stacked bar charts, we were unable to produce statistically significant results:

- *P*-value for the response "There was an alien vessel that crashed, and the truth has emerged over the years" was *P=*.18.
- *P*-value for the response "There was a military research balloon that crashed, and legends about it built up over the years" was *P=*.517
- P-Value for the response "There was a different explanation" was *P=.153*.
- When conducting Linear Regression, we found statistical significance (*P = 0.000688)* between the main effect of Republican Party ID and the question suggesting the false information about Roswell.
- We also found that the interaction effect between false treatment and Republican Party ID for the question suggesting the false information about Roswell was not statistically significant (*P = .78)*.

This means the association between Republican party ID and agreeing with the conspiracy theory is stronger than for other parties, but our actual treatment did not cause this. Interestingly enough, more respondents agreed that the cause of the incident was aliens under the true information treatment than the misinformation treatment (though the difference was not statistically significant).

Discussion & Conclusion

In conclusion, we were not able to produce any statistical significant results from the treatment. We did find that respondents who self identified as Republican were more likely to believe in the conspiracies, however, this was most likely based on preconceived notions rather than the treatment. While the experiment design was sound, there were several controllable variables that could be used in future experiments to produce more accurate results. The first would be the implementation of an additional bot catching question. Since bots are only reading the embedded code on a survey experiment, the implementation of a dummy open response question would aid in filtering them out of the results. Additionally, another improvement that could be used in a future survey would be the use of a lesser known conspiracy theory. Lastly, the use of a shorter, more specialized survey to avoid issues of survey fatigue would result in more accurate responses from the respondents.

Limitations:

- After filtering out potential bots, we were left with fewer than 50 actual respondents from the original 259.
- Additionally, after reviewing the feedback from respondents, the survey length was another issue. The survey experiment was one of 5 survey experiments included in one survey.
- Over half of the filtered respondents were familiar with the Roswell incident and likely had already formed their opinions prior to ever taking the experiment.
- This experiment tested only one conspiracy theory, and further research is needed to determine the generalizability of its findings.

Bibliography

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