Which One Is Correct?

The Decision-Making Process Biased by Media and People's Existing Memory

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Abstract

We believe both people's existing memory and media content will affect people's decision-making. So we use pictures of Rodin's sculpture Thinker, which reflects the Mandela Effect perfectly, to examine the possible different effects between memory and media content. Researcher have edit a very similar set of pictures and let experiment subjects to choose the correct pose of Thinker before and after seeing these pictures. This experiment validates several of our hypotheses about research issues: About events with the Mandela Effect, media content has strong effects on people's decision-making, while it's not decisive; online social media have stronger effects on people's decision-making compare to legacy media. However, we have also falsified that gender has an influence on decision-making and people who believe they are less affected by media will be affected stronger actually on decision-making.

Keywords: Decision making; the Mandela Effect; Online social media; Legacy media

Literature and Expectations

Any decision-making is made under certain conditions and must be affected and restricted by some factors. Throughout the ages, there has been a lot of research on what factors can affect people's decision-making. This article looks at the effects of the Mandela Effect and conformity behavior on social media influence people's decision-making and believes that the two together can induce people to produce false memories. To influence people's decisions.

False Memory

False memory can induce people to make wrong decisions: Fuzzy trace theory is a comprehensive theory used to explain memory, judgment, and decision. This theory emphasizes the characteristics of memory reconstruction, and uses two types of representations to understand memory: (1) faithfully recorded memory traces (2) gist. Accurately recorded memory traces consist of precise details of the information, and the gist is the central idea of the information. Fuzzy trace theory, which is the point, may produce false memories. In the 2009 paper *The effects of polychronic choice on fuzzy trace theory's false memory during decision making* by Dilley, Colin M., the extent to which a decision may be affected by false memory and how erroneous memory affects the effectiveness of decision making are studied.

Conformity Behavior

Conformity behavior on social media can influence people's decision-making behavior: conformity behavior refers to an individual who is affected by the behavior of outside crowds, and in his perception, judgment, and cognition behaves following public opinion or the behavior of the majority the way. Indeed, many political outcomes in recent years are thought to be a result of

social influence on social media, such as the activism surrounding the Brexit referendum in the United Kingdom and the election of Donald Trump as President of the United States (Hern, A. (2017, May 22) Media filter bubbles and algorithms influence the election. *The Guardian*. https://www.theguardian.com/technology/2017/may/22/social-media-election-facebook-filter-bubbles).

Mandela Effect

The Mandela Effect was first defined by self-described "paranormal consultant" Fiona Broome in 2010 and is a shared false memory phenomenon. Pseudo-science critics such as Broome once tried to explain this shared false memory phenomenon with alternative reality, but most scientific researchers have always believed that this is the result of similar cognitive factors. For example, social cognition reinforces incorrect memory or false news reports, and the dissemination of misleading photos. These factors will affect the formation of correct memory. Because the Mandela Effect is ubiquitous in our daily lives, “The overload of information, coupled with the breakdown of traditional thought patterns under the influence of “modernity,” has culminated in the idea that we live in a post-truth world, where people are increasingly forced to determine, or perhaps create, their past, present, and future.” (Aaron French, 2018)

Innovation Research Direction

Although there are many kinds of research about herd mentality, most of them were designed by group pressure to affect the choice of research subjects, which had no detailed classification. Such as the most classic Solomon Asch experiment in the 1950s (let the subjects compare the lines in the two pictures, and publicly say which of the three lines in the second picture

is as long as the lines in the first picture). Besides, there are some studies on the embodiment and application of herd mentality in different fields. Take Jumin Lee's experiment on the effect of negative online consumer reviews on product attitude as an example. The experimenter simulated a shopping scenario, then created ten positives and ten negatives online shopping reviews, half of which are high quality and half of which are low quality. Subjects evaluate products through random reviews.

Based on the above, we are inspired to narrow the scope of our research, focusing on the presentation of the Mandela Effect on social media. We focus on the feature that social media content is mainly produced by all users and exclude the impact of noise from a large number of user groups, that is, instead of using a large amount of data, we simulate a social platform scenario and only use the effective information conveyed in social media as experimental content.

To better explore the actual impact of the Mandela Effect on ordinary people, we designed a series of experiments on the impact of the Mandela Effect on decision-making behavior in different media.

Media

Media, broadly defined as a tool for storing and transmitting information or data, can be divided into legacy media and digital media. Anecdotal evidence suggests that in some situations the impact of social media on personal and managerial decision making can be extensive, and the impact is dependent on which specific social media application is used. (Daniel J. Power & Gloria Phillips-Wren, 2012) Analysis based on a previous related experimental study, more than two-thirds of users are always considering social media networks at the time of getting into a purchase

decision. (Abu Bashar, Mohammad Wasiq, Irshad Ahmad, 2012) Based on an experiment about the effect of social media (Creativity, information sharing and criticism) on decision making. Finding reveals that decisions are influenced by social media through criticism and information sharing. Creativity work on social media has little effect on. (Asif Nawaz, 2015) Due to the decision-making impact of this research on Mandela Effect events, respondents face uncertain events. According to previous research, "When people lack the motivation, opportunity, or expertise to process a message in sufficient detail, they can resort to an assessment of the communicator's credibility. Information on the Internet can be highly misleading, and it is progressively replacing expert advice. (Stephan Lewandowsky, Ullrich K. H. Ecker, Colleen M. Seifert, Norbert Schwarz, and John Cook, 2012)" And considering the digital age, people not only have legacy media such as books, newspapers, and magazines but also have access to a large number of social media software. According to previous observations, when people have more media options to choose from, they are more biased toward like-minded media sources. (Stephan Lewandowsky, Ullrich K. H. Ecker, Colleen M. Seifert, Norbert Schwarz and John Cook, 2012) And there are population characteristics in certain age groups, as in one study, they (adolescent under-investigated) were more likely to like photos depicted with many likes than photos with few likes. (Lauren E. Sherman, Ashley A. Payton, Leanna M. Hernandez, Patricia M. Greenfield, and Mirella Dapretto, 2016)

Then we have the following research questions and hypotheses:

RQ1: How does media content affect people's decision-making about events with the Mandela Effect?

H1: Media content has stronger effects on people's decision-making about events with the Mandela Effect compare to people's inherent memories.

H2: Media content has stronger effects on people's decision-making about events with the Mandela Effect when the process is more cautious.

RQ2: Are there any different effects among different media on people's decision-making about events with the Mandela Effect?

H3: Online social media (e.g. Weibo, Twitter, Facebook) have stronger effects on people's decision-making about events with the Mandela Effect compare to legacy media (e.g. newspaper, magazine).

Individual Characteristics

We can realize that the influence of various media on the Mandela Effect on ordinary people's decision-making is only an external cause, and the differences in the attributes of the interviewees themselves, such as gender, age, and occupation, should also be considered as internal factors. In previous research, we will find "The misinformation effect has been observed in a variety of human and nonhuman species. And some groups of individuals are more susceptible than others." (Elizabeth F. Loftus, 2005)

Therefore, we made the following assumptions in this experiment:

RQ3: Are there any different effects among different people on people's decision-making about events with the Mandela Effect?

H4: People with different gender will be affected differently in decision-making about events with the Mandela Effect.

H5: People who believe they are less affected by media will be affected stronger actually on decision-making about events with the Mandela Effect.

Method & Measurement

Based on the above assumptions, we conducted an online experiment. The experimental subjects are all university students, all aged 20 to 25 years old. A total of 200 people participated in our experiment. In order to ensure that the grouping process is minimally disturbed by other factors, we randomly distributed 100 A questionnaires and 100 B questionnaires to the 200 people. The number of people who got the two questionnaires was one-half of the total number. So that, subjects were divided into group A and group B.

The A questionnaire and the B questionnaire are both divided into three parts, and a page-turning questionnaire is used to ensure that the order of the experimenters' answering is consistent with the order of the questions set in the experiment. The first part is the personal information of the subjects, including gender and age issues, to test our hypothesis: women are more vulnerable to the influence of the media in the decision-making process. The second part is the main body of the experiment. We use the classic Mandela Effect phenomenon—the pose of the Thinker as the starting point, and design three questions: first, the experiment subjects should watch the four Thinker pictures given by the experiment, and based on their intuition, recognize which one is real. The four images show four different postures: right hand against forehead, right hand against jaw, left hand against forehead, and left hand against jaw. After the experiment subjects made their choices, the A questionnaire showed two famous magazines' statements on the pose of Thinker: 1990's novel Leaving Home" by Garrison Keillor described Thinker's pose is right hand against

forehead, and Rodale Press published Men's Health told that the pose is right hand against forehead in 1997, the result is directed to right hand against forehead. The B questionnaire uses Weibo comments to reveal relevant information about the pose of Thinker, and the result is directed to right hand against forehead. The result is oriented to ensure that other variables are consistent, using two different media forms as independent variables to observe that the experiment subjects are receiving different media. Whether there is any change in the decision made after the impact, that is, let the experiment subjects choose again and observe the changes in the two responses-whether they are changed by the interference of the answers suggested by the media content. In the third part, subjects will score according to how much they are affected by the media content in this decision-making process, and they will receive legacy media content (A questionnaire) or social media content (B questionnaires) are scored on a scale of 1-10. It should be noted that in the real Thinker sculpture, the character supports his jaw with his right hand. Here are some snapshots of our questionnaires. For more details, please refer to Appendix.

Figure 1

Figure 2

For H1, we will use the proportion of change choices in the entire sample to measure whether media content has a greater impact than human memory. On the problem with the Mandela Effect, most people's memories are in a gray area, especially in this experiment, when people saw four pictures that were so similar and so real, people's memories became blurred. This gives room for media interference, and human memory still has some influence. We believe that if more than half of the entire sample changed their choices, it would prove that H1 is valid.

For H2, we use the length of the experiment as an indicator to quantify the degree of caution in the decision-making process. In our opinion, the decision-making process with a longer experiment duration is more cautious. We will count the proportion of people who change their choices according to the length of the experiment. If the proportion of changes is longer in experiments with longer durations, it proves that H2 is valid.

For H3, we will compare the respective proportions of changes in the A/B questionnaires and analyze the specific direction in which people change. If people have a higher percentage of changes in the B questionnaire, and the direction of change is consistent with the direction set by the B questionnaire, then we believe that H3 holds, that is, online social media has a greater impact than legacy media.

For H4, we will statistically change the proportion of choices by gender. Since we will not seek equal numbers of male and female subjects in this experiment, we will scale down the collected data according to 100 males and females.

For H5, we use questions 6 and 7 in the questionnaire to make a judgment by changing the proportion of choices. Among the 10 impact levels, we think 0-2 is the weaker impact, 3-6 is the

medium impact, and 7-10 is the stronger impact. If people choose a weaker impact, but their percentage of change choices is high, then H5 is justified.

Result

The following table shows the data after cleaning. We collected 114 A questionnaire results and 163 B questionnaire results. After converting the results to CSV format, we deleted all null columns in the file, and deleted the rows with null values, and retained the first 100 results for the two types of questionnaires. The period column shown in the figure is the experimental duration obtained by subtracting the experimental end time (finish) from the experimental start time (start). The seq column is the number automatically assigned to the test subject by the experiment system, which is only used to distinguish different test subjects; the status column is the experimental status code automatically generated by the system. The Q1 to Q7 columns are the specific results of each question.

Figure 3

Cleaned data to questionnaire A

	seq	start	finish	status	Q1	Q2	Q3	Q4	Q5	Q6	Q7	period
0	1	2019-12-12 18:48:14	2019-12-12 18:49:01	1	1	22	2	2	1	10.0	4.0	47.0
1	2	2019-12-12 20:13:19	2019-12-12 20:14:45	1	2	22	1	2	1	0.0	0.0	86.0
2	3	2019-12-12 21:13:48	2019-12-12 21:14:51	1	2	22	3	2	1	9.0	9.0	63.0
3	4	2019-12-12 21:15:54	2019-12-12 21:17:28	1	2	23	1	2	1	9.0	9.0	94.0
4	5	2019-12-12 21:16:45	2019-12-12 21:17:46	1	2	19	4	2	4	1.0	7.0	61.0
...	...	...	...	...	...	...	...	...	...	...	...	...
95	96	2019-12-12 22:22:11	2019-12-12 22:24:12	1	2	24	2	2	1	5.0	5.0	121.0
96	97	2019-12-12 22:27:14	2019-12-12 22:27:45	1	1	25	1	2	1	3.0	0.0	31.0
97	98	2019-12-12 22:27:53	2019-12-12 22:28:47	1	2	25	1	2	1	0.0	5.0	54.0
98	99	2019-12-12 22:29:43	2019-12-12 22:30:45	1	2	23	1	2	1	8.0	7.0	62.0
99	100	2019-12-12 22:31:30	2019-12-12 22:32:19	1	2	18	1	2	1	3.0	3.0	49.0

100 rows × 12 columns

Figure 4

Cleaned data to questionnaire B

	seq	start	finish	status	Q1	Q2	Q3	Q4	Q5	Q6	Q7	period
0	2	2019-12-12 20:26:41	2019-12-12 20:27:29	1	1	22	2	3.0	1	10.0	4.0	48.0
1	3	2019-12-12 21:15:27	2019-12-12 21:16:22	1	2	23	1	3.0	4	3.0	5.0	55.0
2	4	2019-12-12 21:15:57	2019-12-12 21:17:26	1	2	23	2	3.0	2	6.0	5.0	89.0
3	5	2019-12-12 21:17:23	2019-12-12 21:18:07	1	2	18	1	3.0	2	5.0	3.0	44.0
4	6	2019-12-12 21:17:08	2019-12-12 21:18:37	1	2	20	1	3.0	2	8.0	7.0	89.0
...	...	...	...	...	...	...	...	...	...	...	...	...
95	97	2019-12-12 21:59:34	2019-12-12 22:00:51	1	2	22	1	3.0	2	6.0	5.0	77.0
96	98	2019-12-12 22:00:39	2019-12-12 22:01:55	1	2	22	1	3.0	2	2.0	3.0	76.0
97	99	2019-12-12 22:00:38	2019-12-12 22:01:59	1	2	23	3	3.0	2	3.0	4.0	81.0
98	100	2019-12-12 22:00:39	2019-12-12 22:02:31	1	2	23	1	3.0	2	5.0	2.0	112.0
99	101	2019-12-12 22:03:43	2019-12-12 22:04:02	1	1	18	4	3.0	3	6.0	6.0	19.0

100 rows × 12 columns

First, we made a statistical analysis of the number of people in each option of the A

questionnaire. When choosing for the first time, only 13% of the right answer was right hand/jaw, while the percentages of right hand/forehead and left hand/forehead were higher, 46% and 32% respectively. Under the obvious guidance of the questionnaire set in the A questionnaire, the number of people who chose the right hand/forehead increased significantly, reaching 66%, which was the same as the direction of intervention. Look at the B questionnaire next. The social media presented in the B questionnaire focused on the right hand and started a discussion about whether to forehead or chin. When choosing for the first time, the number of people who chose the right hand/forehead was the largest, accounting for 43%, which was similar to the initial proportion who chose the item in the A questionnaire. After joining the intervention, the number of people who chose the right hand/jaw increased a lot to 38%, while the original right hand/forehead dropped to 37%. This is not entirely consistent with the direction of intervention. In fact, because the intervention of the B questionnaire itself is not very clear, the subjects need to understand the dialogue in the Weibo message by themselves.

Figure 5

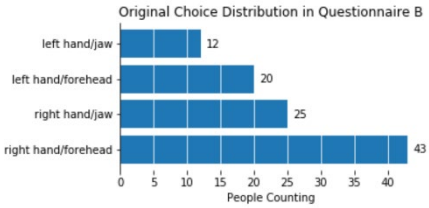


Figure 6

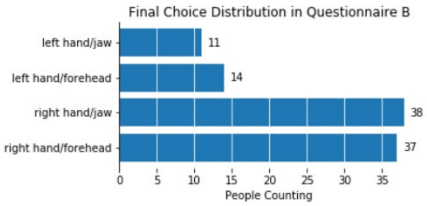


Figure 7

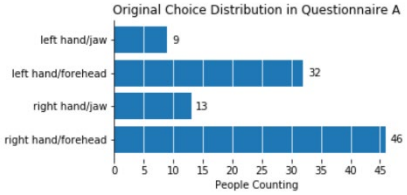
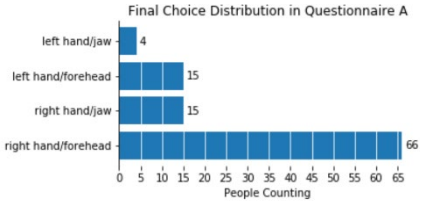


Figure 8



In order to see more clearly the connection between two choices, we have drawn the following Sankey diagram. It can be seen that in the A questionnaire, most of the changes were guided from the other three options to the right hand/forehead.

Figure 9

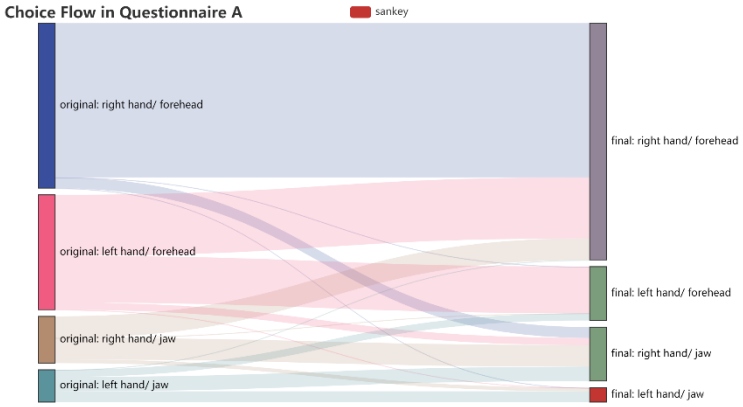
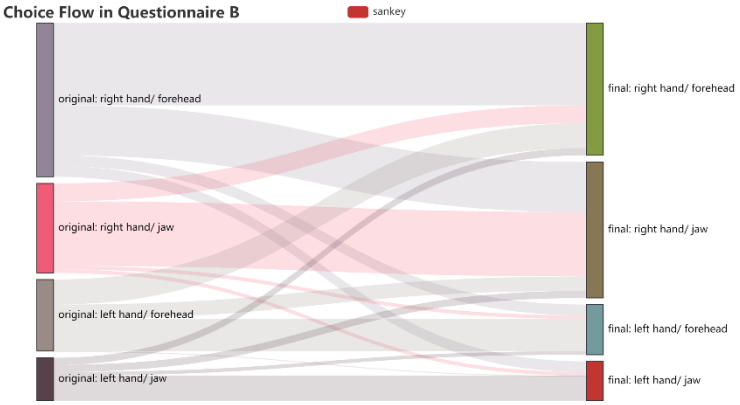


Figure 10



We found that 35% of the A questionnaire (legacy media) chose to change their minds after the intervention, and 43% of the B questionnaire (online social media) changed their minds. However, both do not exceed 50%, and the overall ratio is low. It can be seen that the H1 does not hold, that is, the media has a certain impact on people's decision-making, but the impact is limited,

which does not mean that the media has more influence on people than memory affects people. At the same time, we also found that the proportion of changing choices in the B questionnaire is greater than the proportion of changing choices in the A questionnaire, which proves that online social media has a greater impact on people's decision-making than legacy media. Compared with the previous analysis, we believe that H3 holds.

Figure 11

When verifying H2, we first binned the duration of the experiment (mean: variance :) in order to discretize data and delimited the range of durations in 60 and 120 seconds, respectively. In the A questionnaire, the longer the experiment duration, the more likely the experiment subjects to change options: when people completed the experiment within 60 seconds, 32% of people changed their choices; when people took between 60 seconds and 120 When the experiment was completed in seconds, 35% of people completed the experiment; when people spent more than 120 seconds, 43% of people changed the choice. However, in the B questionnaire, we did not find a similar monotonous growth relationship: when people completed the experiment within 60 seconds, 33% of people changed their choices; when people completed between 60 seconds and 120 seconds During the experiment, more than half (52%) of people changed their choices; when people spent more than 120 seconds, the proportion of change choices dropped sharply, only 25%.Therefore, we believe that the longer the reading and viewing time is, the greater the impact

will be on obtaining information in legacy media, and this phenomenon is not obvious in online social media, and further research is needed.

Figure 12

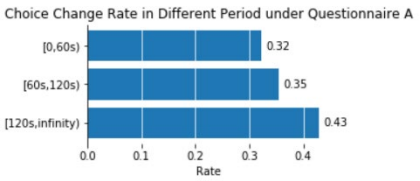
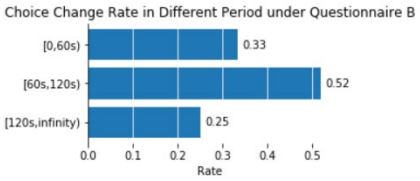
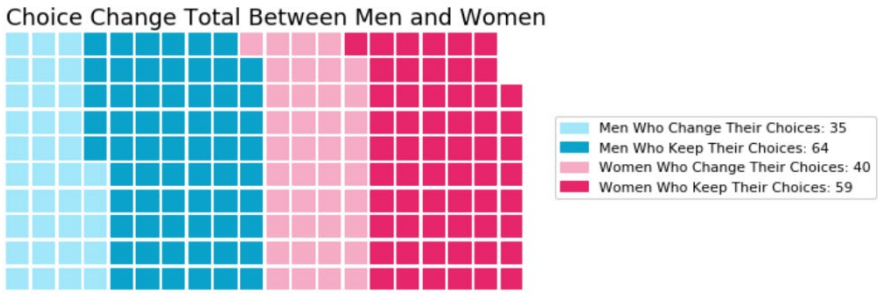


Figure 13



We also performed a visual analysis of the gender data of the experimental subjects to test our H4 The data proved that although the number of women changed slightly more than men (40% women, 35% men), it was not obvious. Regardless of gender, about 60% of people choose to stick to their original options. Therefore, H4 does not hold.

Figure 14



In the study of self-evaluation and change ratio, we made the following statistical analysis. On the whole, whether it is the A questionnaire or the B questionnaire, the proportion of change is also higher among those who think they are more affected by the media; and the proportion of those who think they are less affected by the media is obvious Lower than the former. Specifically, for the A questionnaire, the percentages of change of those who chose "feel little affected" and

"fell moderate affected" were basically the same (24% and 25%, respectively), while those who chose "feel much affected" had their percentages changed Reached 49%, reaching half. In the B questionnaire, only 19% of those who chose "feel little affected" changed their options, 43% of those who chose "fell moderate affected" changed their options, and those who chose "feel much affected" had 59% of their changes. This shows that the H 5 does not hold. Compared with the A questionnaire, the B questionnaire results are more discrete, which shows that in the face of online social media, people have a more accurate understanding of whether they will be affected, and the influence of legacy media on people is more subtle, and people may underestimate their influence.

Figure 15

Figure 16

Discussion

We have set the "the posture of the Thinker is right hand against forehead" on media content to induce users to choose this option. Comparing the test results, we found that regardless of Volume A or Volume B, the distribution of options initially selected by users was roughly the same, but after the influence of legacy media, most users changed the option to "right-handed forehead", which was in line with our expected results; The percentage of media-affected users choosing this option has decreased. We speculate that this is because legacy media is more authoritative and has a greater impact on user decisions, users will therefore be willing to spend more time reading

legacy media content; On the contrary, people remain sober and skeptical of news from social media. We believe that this is because with the advent of the new media era, while self-media social platforms such as Weibo have grown rapidly, some disadvantages have also accompanied Here: For example, the number of news has increased significantly, and false and untrue reports have flooded the media platform. These have brought challenges to the authenticity of the news, leading to a decrease in users' trust in the information from Weibo, which makes the social media platform. On the contrary, the information will stimulate the rebellious psychology of, some users.

With the popularity of social media like Weibo, each user can produce, edit, and publish content of interest as he or she wants. Fragmentation, personalization, and social networking are the main information characteristics. There features lead to flood of information, reduced professionalism in journalism, and make the media no longer have the "exclusive news" monopoly position. In addition, due to the improved timeliness of news in the digital media era, major new media platforms specializing in content aggregation and distribution have gradually emerged. While improving the efficiency of content product distribution and matching, it has also caused serious information pollution. This series of features has caused social media to be severely labeled as " Broken promise" by some users.

After analysis, we found that there are some areas that can be improved in the experiment.

Firstly, because the size of the picture is limited by the questionnaire website, the experimental content may not be well communicated to the experimental subjects, which may cause some experimental errors. Different from legacy media, social media can combine text, pictures, audio, video and other diversified ways to deliver content. In contrast, video can stimulate

the audience's vision and hearing at the same time, which is a more significant way of communication effect. In the era of social media, video seems to have become a mainstream way of influencing people's decision-making, for example, beauty bloggers show the audience the product features directly through video, thereby achieving the effect of saling goods. Therefore, in future research we can present the experimental content in the form of video. Let the subjects watch a vlog containing the scene of visiting the pirated Thinker, or watch a short dialogue video discussing the correct posture of the Thinker, so that they can get effective information from the video content to make decisions.

Secondly, in order to reciprocate the authoritativeness of the messages from legacy media we provided in the experiment, our experiment can be improved by using the "celebrity effect" on information from social media. "The Celebrity Effect" is a collective name for the effects of celebrity appearance that attracts attention, strengthens things, and expands influence, or that people mimic celebrity psychological phenomena. In the experiment, we can provide forged messages sent by influential and more authoritative users on Weibo, supporting "the posture of the Thinker is right hand against forehead", and observe whether the influence on the user is higher.

Although our research mainly focuses on social media, we don't seem to take too much the impact of different platforms as sources on people. At present, there are many social media platforms with different positioning, which establish their own brand image. When a more serious and professional social platform is used as a source of information, the degree of impact on people's judgment may be increased; on the contrary, when entertaining and interactive social media are used as a source of information, the degree of impact on decision-making may be reduced. The

social media selected in this experiment is Weibo, which has a large number of users in China, and is a relatively neutral platform of entertainment and professionalism. In future experiments, we can add a more professional platform, such as Zhihu, to compare with it and see if the experimental results will change greatly.

Based on the above, we think it’s necessary to extend the scene and personal emotion in further research as well. The content setting of the examples we used in our experiment is simple, and the experiment process is short, so we can think that it is not affected by the scene and emotion. However, in our daily life, we often watch and receive certain content in a certain scene. People may have different emotional reactions in different scene settings, which will also cause different choices and judgments. In the future, we can do scenario simulation, introduce emotional variables, and explore the relationship between people's decision-making process and social media in a more real environment.

In addition, it needs to be noted that this experiment is limited by the form of network questionnaire. The experimental environment, the viewing time of experimental content and the number of experimental people is uncontrollable, which may have an impact on the final experimental results. Therefore, the future research needs to be improved in the experimental form. Randomly select 200 subjects to enter the laboratory, watch the given experiment content within the specified time and make personal selection without communication. If conditions permit, they can successively enter the laboratory for personal experiments to reduce external interference factors.

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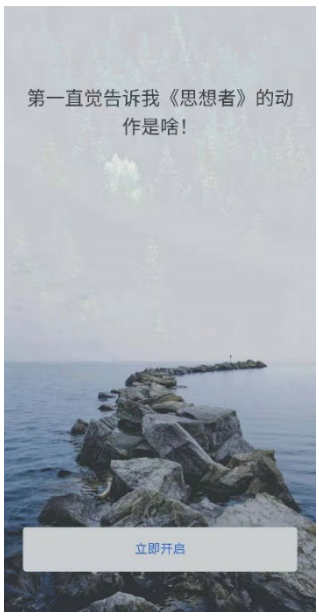
Appendix

Demonstration of Questionnaires



Raw Data & Source Code

For more details about raw data and source code, please refer to:

https://github.com/tudousponge/COMM7340-Golf/tree/master/coding