AD-MINISTER

SHAHO SABBAR

ALIREZA
ABDOLLAHINEZHAD

AKO HEIDARI

FATEMEH MOHAMMADI

UNIVERSIDAD
EAFIT ®

KNOWLEDGE MANAGEMENT IN THE AGE OF UNRELIABLE MESSAGES. DO UNIVERSITY STUDENTS TRUST ONLINE MESSAGES? (A SURVEY FROM THE MIDDLE EAST)

GESTIÓN DEL CONOCIMIENTO EN LA ERA DE LOS MENSAJES POCO CONFIABLES. ¿LOS ESTUDIANTES UNIVERSITARIOS CONFÍAN EN LOS MENSAJES EN LÍNEA? (UNA ENCUESTA DE ORIENTE MEDIO)

SHAHO SABBAR[1]*

ALIREZA ABDOLLAHINEZHAD[2]

AKO HEIDARI[3]

FATEMEH MOHAMMADI[4]

ABSTRACT

We are exposed to a constant stream of messages many of which originate from unreliable or untrustworthy sources. Moreover, it is not possible to control the messages before they are published and allow the dissemination of the verified ones only. Growing a critical mind can be a practical way to prevent the accumulation of incorrect or inaccurate information in our brains. The current study tried to see whether or not university students hold a critical view of social media messages. First, in a qualitative study, hundreds of messages shared on social media were observed, 12 of which were chosen based on the popularity of their central themes. Many of the messages contained an extraordinary claim such as the existence of mermaids, human-like complex emotions in animals, etc. Then, in a survey, the chosen messages were shown to 379 university students. The respondents were asked to express their opinions about the messages. For each of the 12 messages, between 36 to 94 percent of the respondents just assumed the messages to be true. The analysis of the responses revealed weak critical thinking among the students.

KEYWORDS

Social network, Message, Critical thinking, Media literacy, Trust, Flow of information

RESUMEN

Estamos expuestos a un flujo constante de mensajes, muchos de los cuales se originan en fuentes no confiables o fidedignas. Además, no es posible controlar los mensajes antes de su publicación y permitir la difusión únicamente de los verificados. Desarrollar una mente crítica puede ser una forma práctica de prevenir la acumulación de información incorrecta o inexacta en nuestro cerebro. Este estudio trató de ver si los estudiantes universitarios tienen una visión crítica de los mensajes de las redes sociales. Primero, en un estudio cualitativo, se observaron cientos de mensajes compartidos en las redes sociales, 12 de los cuales fueron elegidos en función de la popularidad de sus temas centrales. Muchos de los mensajes contenían una afirmación extraordinaria, como la existencia de sirenas, emociones complejas similares a las humanas en los animales, etc.

1 Assistant Professor Faculty of World Studies, University of Tehran. Email: shaho.sabbar@ut.ac.ir ORCID: https://orcid.org/0000-0001-5801-7137
2 Associate Professor Allameh Tabataba'i University. Email: abdollahinejad@atu.ac.ir ORCID: https://orcid.org/ 0000-0002-4966-4225
3 PhD Student. Institutional affiliation George Mason University. Email: aheidari@gmu.edu ORCID: https://orcid.org/ 0000-0002-9033-6223
4 Assistant Professor Allameh Tabataba'i University. Email: fatemehmohammadi@atu.ac.ir ORCID: https://orcid.org/ 0000-0002-9145-9997

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Luego, en una encuesta, se mostraron los mensajes escogidos a 379 estudiantes universitarios. Se pidió a los encuestados que expresaran sus opiniones sobre los mensajes. Para cada uno de los 12 mensajes, entre el 36 y el 94 por ciento de los encuestados simplemente asumieron que los mensajes eran verdaderos. El análisis de las respuestas reveló un débil pensamiento crítico entre los estudiantes.

PALABRAS CLAVE
Red social, mensaje, pensamiento crítico, alfabetización mediática, confianza, flujo de información.

INTRODUCTION

"Heating water in a microwave oven can cause cancer; a minister has transferred millions of dollars of state budget into his account; a famous person can cure incurable diseases using his hands' energy; the government is planning to freeze 40 percent of everyone's money in the banks due to its huge deficit". If you are a user of digital social media, these are among the messages that you are likely to receive today.

We live in the information age, an era that was supposed to be an answer to our public ignorance. However, in a time when information is easily accessible for everyone, everywhere, we, as the public, do not seem to have gained a more factual knowledge about life and things around us. We have a significantly greater amount of data on our minds than any individual who used to live only decades ago but we receive most of the information through unreliable sources (Ghazali et al., 2017).

The problem of the reliability of the shared information is not limited to social media. Even the professional media (e.g. medical journals) and the scientific organizations have their issues (Larsson et al., 2003) but especially after the revolution of Web2 technologies (Shahghasemi & H. Prosser, 2019) and in a network in which young or old, educated or uneducated, and professional or unprofessional users can freely send and share messages, the problem is more apparent and potentially more critical.

The information age has its promises too. We are buried under a huge amount of information but we also have the power to carry out a relatively simple search to make sure about the factuality of a message that we have received. However, the sheer number of messages that we receive daily makes it impossible for people to research the factuality of all messages – even if they have the skills to do so. Therefore, the only plausible way seems to be: researching some and ignoring many. The question is if the public do so.

If we receive some food from an untrustworthy source, we would probably not eat it unless we make sure it is healthy. The same rule must go for a message coming from an unknown or unreliable source. In a network where every individual and entity is capable of easily fabricating or distorting messages and share fake news or false information (Crespo et al, 2020), the best strategy is arguably remaining skeptical and ignoring the received messages (as most likely incorrect) unless we can research the reliability and trustworthiness of the message or its source.

We do not have information on the percentage of the reliable/unreliable or true/ false messages shared on social media. However, misinformation and disinformation

are regularly shared on social media. Intentionally created fake news is just one instance. This is a challenge across different online platforms. The focus of the current research study is *social media* which is significantly used by "all demographics" (Shahghasemi & Emamzadeh, 2019).

A video shows a huge snake quickly swallowing a deer. The caption says: look how the snake's powerful jaws can swallow a deer in less than a minute. For those who are more familiar with snakes, the video looks somewhat suspicious because the entire incident happens while people are standing around the snake and one of them is tapping on its body. However, one may call it too skeptical to doubt the authenticity of this message. First, because it is a video and the audience can see what is happening with their own eyes. Second, why would someone fake such a video? There does not seem to be a clear political or economic motive to fabricate such a video.

The reality is that snakes do not swallow huge prey while surrounded by a dozen men; especially when someone is tapping on their back. On the contrary, if they sense a threat, they would throw up a previously swallowed pray, to be able to escape. If you play the video backward, that is exactly what happened. For some reason, someone reversed the video and wrote a misleading caption on it. It seems that we cannot be skeptical or suspicious enough of the messages received through social media and the internet.

Research Question. The current study aims to answer the following question: Do people (in this case, a group of university students) easily believe the messages they receive on social media or are they inclined to cast some doubt, especially when faced with messages that contain an extraordinary claim?

As argued, such skepticism seems to be one of the main ways to keep people from accumulating false information in their brains. Moreover a brief look at the literature indicates that the current body of research has not much addressed the issue and therefore it is important to design research studies to measure people's trust/skepticism when faced with online messages.

LITERATURE ON TRUST AND MEDIA LITERACY

The current study is concerned with trust and skepticism. Keywords related to "trust" do not lead to many studies with a similar concern. Some studies deal with trusting a *node* or some nodes of the network, say a company or its products (Martínez & Rodríguez del Bosque, 2013; Hoq et al., 2010; Luarn & Lin, 2003). Others speak of trusting the network as a medium. For example, a study titled *Trusting the Social Media in Small Business* (Kahar et al., 2012) seeks to answer if small business entrepreneurs trust social media to promote their work.

Some studies have investigated trust from a psychological angle (Rotter, 1980). Some others have studied *trust* as an organizational and managerial factor (Jarvenpaa et al., 1998). Others tried to find patterns to explain why and when different media are more trusted by people (Sabbar & Hyun, 2015). However, a search using the keyword

trust does not usually lead to the studies concerned with people's unjustified and probably unhealthy trust in online messages.

Studies with a similar concern about people's easy trust, usually fall under the concept of media *literacy*. It is hard to present a literature review on media literacy because it covers a diverse range of issues from specific aspects of using media-related technologies to broad discussions on the role of media in the society (Kumar, 1987). Different topics from people's critical thinking and skepticism to people's skills in using different features of their smart phones can be all considered sub-topics of media literacy.

In many relatively newer studies the technical and logical aspects of media literacy have been both addressed (see: Lee, 2016). Luke argues that teaching the cultural aspects of media literacy, and information and technology studies cannot be taught independently of each other anymore (Luke, 2007).

The multi-faceted nature of the literacies needed at the age of digital information has led to the development of numerous concepts such as media literacy, information literacy, data literacy, news literacy, critical literacy (Weng, 2021), digital literacy, etc. Each of these concepts can cover very different aspects of our social lives including identity (Robinson, 2019), professional development (Rogers et al., 2021), etc.

Media literacy can be seen as a window to teaching a broad range of cultural and intercultural issues (Bruinenberg et al., 2021). An example is teaching critical media literacy in order to familiarize adults with diversity (Tisdell, 2008). Many of these studies see media literacy as a way to "empower citizens for a mediatized world" (Mateus, 2021).

A major subfield of media literacy that is also closest to the current study's question, addresses the issue of correctness and accuracy of online or social media messages. Many of these studies address people's ability to distinguish true information from misinformation, disinformation, and fake news (see: Hornik & Kajimoto, 2015; Lee, 2016). Some researchers have looked into the pedagogical and school-based approach to teaching media literacy (see: Scheibe, 2004; Westbrook, 2011; Hobbs, 2004).

Here, a major concern is that if the critical thinking of people (and especially children) improves, they would be less likely to fall for fake news, misinformation, or different kinds of fraud. For instance, it has been argued that such critical thinking skills could reduce the negative impacts of TV on children (Singer & Singer, 1998). Also, improved critical thinking may help people identify fake news (Jones-Jang et al., 2019).

Rather than focusing on the audience of social media messages, some studies have directed their attention on the systems and methods that may help more accurate messages flow through digital information networks (see: Riser et al., 2020). Verification labs and verification experts that would monitor the popular online messages and conduct fact-checking for the public are among the foci of these studies (see: Kruger, 2017).

The current study has a different focus, as it aims to investigate whether or not people actually easily trust online messages. To the best of our knowledge little scholarly attention has been dedicated to answering this question. The "growing concern over fake news" (Haggar, 2020) has led to the publication of more research studies in the field of media literacy, many of which looking at media literacy as a way of empowering the society against fake news (Horn & Veermans, 2019).

When the concern is people's critical thinking, sometimes the issue of trustworthiness of the messages is addressed. However, even in such cases, skepticism is not the main concern and different aspects of people's understanding of the age of internet and social media are discussed (see: Polizzi, 2021). More study needs to be done on people's trust/skepticism toward messages, in their actual day-to-day life.

Rather than addressing the techniques that may enable people to distinguish information from misinformation, this study is focused on the detriments of blind trust in social media messages. As argued, this is specifically important because most people cannot get the required knowledge to distinguish information from misinformation in all fields and they can never dedicate enough time to researching and analyzing every piece of information they come across online.

The significance of this research lies in the fact that it intends to measure to what extent the students taking part in this study are skeptical about the messages they receive through social media. Also, it uses a method to ensure that the respondents are not aware that their skepticism level is being tested.

METHODOLOGY

The study is comprised of two qualitative and quantitative parts. First, in a qualitative work, several hundred messages shared on Telegram, the most popular social network in Iran, were reviewed. Through a qualitative approach, the researchers tried to find the most popular themes among the messages and picked 12 messages that included those themes. Two researchers worked on the messages shared on popular Telegram groups.

Since the research is concerned with the concept of trust, the study held an intentional bias toward messages and themes that were harder to believe. For instance, two of the chosen messages say or imply aliens have visited the earth in the past and mermaids exist. Except for one of the 12 messages, the others were factually untrue. The messages were not created. They were simply found and picked. However some of the messages were made shorter, simpler and more easily understandable.

The qualitative part of the study did not include a quantitative-type sampling and it was not aimed at making generalizable claims. Therefore, the extracted themes are not necessarily the most popular themes and the study could not make any quantity-based generalization. The messages and their central themes were investigated and the ones with more interesting themes for Iranian audiences were chosen. The messages were chosen based on the following criteria.

1. **True/False applicability:** This study aims to investigate if people doubt the truth of messages they receive on social media. However, regarding a large percentage of the messages that flow on social networks, asking a true/false question would be meaningless. Many messages depict an interesting picture, a beautiful dance, or a funny hidden-camera prank. Others tell a joke or share a song. We chose among materials that one could ask about their factuality.

2. **Non-obviousness:** many of the messages to which the true or false question applies, seem to be obvious. Highly skeptical minds may consider most messages non-obvious. For instance, if a message presents a beautiful scene with a caption saying "this is a beautiful scene from our country", a highly suspicious mind may doubt if the location is where the caption says.

This study did not want to set the bar too high in terms of critical thinking, therefore for instance a message was chosen that said: a female dog hugged her puppies and cried after she managed to find a shelter for them. This is not a true message. Even though dogs are emotional animals, tears coming from their eyes cannot be a result of emotions. However, one does not need to know this fact to doubt that dogs have such a sophisticated level of emotions that they can solve a problem and then hug their children and drop happy tears.

The final 12 messages are as follows. As the study was done on Iranian social networks and the respondents were Iranians, clearly the original messages were in Farsi. They were translated into English for the sake of presenting them in this paper. Each text was accompanied by a related picture.

1. A female dog hugged her puppies and cried after she managed to find a shelter for them.

2. There have been similarities between an ancient statue and modern astronaut hats, which confirms the theory that aliens have visited the earth in previous centuries.

3. Historical monuments show that the necktie originated from what was used in ancient Iran.

4. The largest turkey sandwich was eaten by a mob in Mellat Park [in Tehran] before the Guinness representative could register it.

5. [Iranian] Dr. Arkani is a Harvard University Professor. He was given Albert Einstein's seat at Princeton University that was left vacant since Einstein's death.

6. While many believe that The Kaaba [the most sacred Islamic site in Mecca] is exactly the center of the earth's surface, scientists have shown that the center of the earth's surface is on a location between Germany and Switzerland.

7. Cyrus the Great [the ancient Persian King] said: I don't have time to hate those who hate me. I'm busy loving those who love me.

8. Remains of a mermaid were found on the shores of England.
9. A Danish television anchor died while reading a news story that insulted Prophet Mohammad.
10. A Japanese tourist saw trash around the Palace of Ardashir and started cleaning up.
11. A European tourist, who came to visit Persepolis barefooted, cried happy tears.
12. The latest studies show that our emotions have measurable frequencies. Scientists believe that the discovery is a beginning to finding the human mind's supernatural abilities.

To the best of our knowledge, all but one message (number 4) were factually untrue or at least included inaccurate information.

The qualitative part of the study was used to prepare the questions. Afterward, we surveyed a representative number of the students of Allameh Tabataba'i University. The university has over 10 thousand students. The minimum number of randomly chosen students that can be considered a representative sample is calculated using the following formula in which N is the population size, e is the margin of error, z is confidence level and p is the percentage value.

$$[Z^2 \times p(1-p) \,/\, (e^2)] \,/\, [1 + (Z^2 \times p(1-p))/(e^2 \times N)]$$

The result is 371. The questionnaires were given to 379 randomly chosen undergraduate and graduate students of Allameh Tabataba'i University in the city of Tehran. The questionnaire included demographic questions as well as questions on the participants' activity on social networks. The questionnaire also included 12 messages similar to those that people receive through social media. The respondents were asked to express their opinions about the messages hoping that they would provide clear information for the researchers to realize whether or not they believed the messages to be true.

CODING

Once the respondents had filled the questionnaires we needed to analyze their comments to find out if they had doubted or trusted each of the twelve questions. If all those who filled the questionnaire had commented on all the 12 messages this would involve a careful analysis of some 4800 comments. However, since many of the respondents ignored some of the messages, the number was well below that. However, it is always difficult to reach a coding process that reliably analyzes comments and read the minds of the writers.

Three coders cooperated in the coding process. They read the comments and wrote preliminary operational definitions, defining when the commenter believed the message and when she or he doubted it, or did not believe it. Whenever reaching

a decision was hard, the respondent's comment was marked *unclear*. The researchers coded a number of the responses, compared the results, discussed the disagreements, and refined the definitions over and over. The three coders did so until they reached a level of confidence beyond acceptable for a research study.

In most research projects where more than one researcher does the coding, each coder is assigned to work on a part of the data. This makes inter-rater agreement critical because different parts of the data are evaluated differently. Here, the three coders (two assistants and a leading researcher) first worked on the same 80 messages and compared their results, argued the disagreements, and refined the definitions. Even after that, the messages were not divided among the coders. The two assistant researchers did the coding of the entire messages.

At this point, Cohen's Kappa was calculated which confirmed that the coding process was reliable.

$$k=(Pr(a)-Pr(e))/(1-Pr(e))k=(Pr(a)-Pr(e))/(1-Pr(e))$$
The calculated Kappa was 0.93 which means excellent inter-rater agreement.

However, then the three researchers argued the disagreements and decided on the final choices for each message. Therefore, the final agreement rate was 100 percent but being aware of the importance of having clear operational definitions, acceptable by common sense, we calculated Kappa before this final state to make sure about the reliability of the coding.

DATA ANALYSIS
The following table presents the frequencies and percentages of the respondents and their demographic information. The table shows different groups of respondents based on their age, gender, education, marital status, and the part of their expenses that they earn on their own, as opposed to the money they receive from their parents.

Table 1 – Frequencies of respondents based on age, income, and education

Age Group			Expenses Covered by working			Education		
18-25	Frequency	298	Less than half	Frequency	274	Bachelor's	Frequency	217
	Percentage	79.9		Percentage	77.4		Percentage	58.2
26-33	Frequency	67	Half	Frequency	34	Master's	Frequency	134
	Percentage	18		Percentage	9.1		Percentage	35.9
34-41	Frequency	8	More than half	Frequency	46	PhD	Frequency	22
	Percentage	2.1		Percentage	12.3		Percentage	5.9
Total	373		Total	354		Total	373	

Table 2 – Frequencies of respondents based on gender and marital status

Gender			Marital Status		
Female	Frequency	320	Single	Frequency	352
	Percentage	85.8		Percentage	94.4
Male	Frequency	53	Married	Frequency	20
	Percentage	14.2		Percentage	5.4
Total	373		Total	373	

Nearly 80 percent of the respondents were 25 years old or younger and most of them covered less than half of their expenses. Nearly 86 percent of the respondents were female and most of them were single. We also dedicated several questions to investigate the respondents' media consumption. The following table shows how much time was spent on computers, the Internet, social networks, and television.

Table 3 – Frequencies of respondents based on media consumption

Daily Use of Computers (hours)			Daily Use of the Internet (hours)			Daily Use of Social Networks (hours)			Daily Time Spent on TV (hours)		
1 or less	Frequency	166	1 or less	Frequency	34	1 or less	Frequency	69	1 or less	Frequency	281
	Percentage	44.7		Percentage	9.2		Percentage	20.9		Percentage	76.4
2 - 4	Frequency	143	2 - 4	Frequency	183	2 - 4	Frequency	205	2 - 4	Frequency	81
	Percentage	38.5		Percentage	49.3		Percentage	62.1		Percentage	22
Over 4	Frequency	62	Over 4	Frequency	154	Over 4	Frequency	56	Over 4	Frequency	6
	Percentage	16.8		Percentage	41.5		Percentage	17		Percentage	1.6
Total		371	Total		371	Total		330	Total		365

As the table indicates, over 41 percent of the respondents spend over 4 hours on the internet, while only 1.6 percent of them spend over 4 hours watching television. Over three fourth of the respondents spend one hour or less on TV. On the other hand, nearly half of the respondents said that they used computers for one hour or less per day. The data implies that the internet is the predominant media and people mainly connect via their cellphones.

We also compared different social networks based on their popularity for the respondents. Telegram was by far the most popular social media used by our respondents. Over 81 percent of the respondents use Telegram at least every two days.

Table 4 – Frequencies of respondents based on the social network use

		Instagram	Line	WhatsApp	Telegram	Facebook	Twitter
Use at least every two days (n = 337)	Frequency	106	15	65	274	26	19
	Percentage	31.4	4.5	17.4	81.3	7	5.1

The following table contains the data showing how many of the students believed or doubted the messages. We extracted separate numbers for each of the 12 statements.

Table 5 – How many students believed each of the 12 messages?

	Message	Believed	Didn't believe	Total
1	A female dog hugged her puppies and cried …	201 / 93.1%	15 / 6.9%	216 / 100%
2	… aliens have visited the earth in previous centuries.	118 / 59.9%	79 / 40.1%	197 / 100%
3	… the necktie originated from what was used in ancient Iran.	125 / 70.2%	53 / 29.8%	178 / 100%
4	The largest turkey sandwich was eaten by a mob …	187 / 96.9%	6 / 3.1%	193 / 100%
5	[Iranian] Dr. … was given Albert Einstein's seat at Princeton University …	170 / 91.4%	16 / 8.6%	186 / 100%
6	… the center of the earth's surface is on a location between Germany and Switzerland.	66 / 42.6%	89 / 57.4%	155 / 100%
7	Cyrus the Great … said: I don't have time to hate …	146 / 71.9%	57 / 28.1%	203 / 100%
8	Remains of a mermaid were found …	75 / 47.5%	83 / 52.5%	158 / 100%
9	A Danish television anchor died … [after she] insulted Prophet Mohammad.	72 / 36.7%	124 / 63.3%	196 / 100%
10	A Japanese tourist saw trash around the Palace of Ardashir and started cleaning up.	209 / 96.8%	7 / 3.2%	216 / 100%
11	A European tourist, who came to visit Persepolis barefooted, cried happy tears.	162 / 93.1%	12 / 6.9%	174 / 100%
12	The latest studies show that our emotions have measurable frequencies …	136 / 85%	24 / 15%	160 / 100%

Out of twelve messages, five messages were trusted by over 90 percent of the respondents. As for three other messages, 70 to 85 percent of the students just assumed them to be true. Between 36 to 60 percent of the respondents assumed the four remaining messages to be true.

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We also looked for significant relations between the respondents' trust in the messages and their demographic information and media consumption. Since there wasn't a scientifically acceptable way to classify the messages, we checked the relations for the 12 messages individually. The trust variable gets two values (0, 1) indicating whether the respondents believed the message or not. The relationship between trust and other variables was investigated. Since trust is a categorical variable, chi square was used to check the existence of any significant relationships.

We did not find any significant relationships between the level of trust and the respondents' marital status. There were three significant relations between the respondents' gender and the level of trust in three of the messages. One of the relations was between trusting the first message (female dog) and the respondents' gender. Compared to male participants, a higher number of female respondents believed the message. In the case of two other messages (2nd and 3rd), also female students were more trusting. We didn't see significant relationships between the level of trust in the other nine messages and the respondents' gender.

Whether or not the respondents themselves cover their expenses using the money they earn, only showed correlation with the third message. The students who cover about half of their expenses were more suspicious of the message compared to those who earned much less or much more. This could have resulted from a third variable. In any case, it is not easy to explain this result.

Interestingly and understandably the level of education showed significant relation with trusting the highest number of messages: the 2nd message (about aliens visiting the earth), the 3rd message (about the use of neckties in ancient Iran), the 7th message (a quote from the Iranian ancient king), the 8th message (the discovery of the remains of a mermaid), and the 11th message (about a tourist crying while visiting a historical site).

Regarding the 2nd message, 65.3 percent of the bachelor's students, 55.9 percent of the master's students, and 12.5 percent of the Ph.D. students believed that it was true without doubting it. Similarly, the level of trust showed a direct reverse relation with trusting the 8th message as well. 55.1 percent of the bachelor's students, 37.7 percent of the master's students, and only 14.3 percent of the Ph.D. students believed it to be true.

As for the other three messages that had significant relations with the level of education, the Ph.D. students were the most suspicious ones. However, the master's students didn't seem to be more suspicious than the bachelor's students.

Table 6 – Ph.D. students were the most suspicious of the messages

	Trusting BA students	Trusting MA students	Trusting Ph.D. students
3rd message	72.9%	73%	12.5%
7th message	73.2%	77.9%	25%
11th message	94.1%	95%	75%

Regarding all the five statements the Ph.D. students proved to be considerably more skeptical of the messages than the BA and MA students. Age had a significant relationship only with the level of trust in the 10th message. 97.7 percent of the people between 18 and 25 believed the message to be true. 94.4 percent of the respondents between 26 and 33 believed the message but 75 percent of those between the ages of 34 and 41 did so. However, one can argue that this might be the result of a different variable such as education if age and education are in direct relationship.

Regarding the respondents' media consumption and the use of different social media, we found several significant correlations. However, each variable showed only correlations with some of the 12 messages. Watching TV showed significant correlations with the 1st and the 7th messages.

Table 7 - Significant correlations between trusting messages and time spent on watching TV

Daily time of watching TV	1 hour or less	2-4 hours	Over 4 hours
Believed the 1st message	93.5%	94.3%	60%
Believed the 7th message	66.7%	83%	100%

Using social networks had a significant correlation with the 11th message. Using the internet had no connection with trusting the messages. Using computers had significant correlation with the 5th and the 7th messages.

Table 8 - Significant correlation between trusting messages and time spent on social networks and computers

Daily time of using social networks	1 hour or less	2-4 hours	Over 4 hours
Believed the 11st message	80%	95.6%	96.8%
Daily time of using computers	**1 hour or less**	**2-4 hours**	**Over 4 hours**
Believed the 5th message	94%	85.9%	100%
Believed the 7th message	77.4%	73.1%	53.1%

We failed to see an obvious pattern showing how people's media consumption can be used to explain the level of trust and suspicion regarding messages that they receive from social networks.

RESULTS

The 4th and 10th messages "mob eating a sandwich" and "a Japanese tourist…" gained the highest levels of trust by the respondents. Nearly 97 percent of the respondents simply assumed that the incidents reported in the messages did happen. Only 3 percent of the respondents showed a kind of doubt for instance by asking for a source or questioning the factuality of the message[1].

Also, two other messages were assumed to be true by more than 90 percent of the respondents: the 5th message "giving Albert Einstein's seat at Princeton University to an Iranian Academic." and the 11th message that says a "European tourist came to visit an Iranian ancient monument barefooted and cried".

The results show that the level of education can be the best factor to predict one's trust or doubt regarding the messages. This can be evidence for the promising idea that by educating people, they can get more critical of the messages they receive through social media. Many of the characteristics that we checked in this study failed to show significant correlation with the level of trust or being critical of the messages.

The fact that the students are easy believers of media messages and age or other factors (except for education) cannot predict their trust level strengthens the idea that no factor might be as powerful as education in this regard. We cannot hope to encourage the whole society to get Ph.D.s but probably direct and indirect efforts to increase people's media literacy can make great improvements.

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1 It is arguable that whether or not the messages are true is irrelevant here. What we expect the respondents to do is showing a kind of doubt. However, if the message is true there is a chance that the respondent saw the message before and made sure that it was true and that is the reason that he or she didn't show any doubt. For this reason the messages were mainly chosen from those that are not true and with very inaccurate content.

CONCLUSION

Skepticism is (or should be) deemed as a precious asset these days. Of course, having an ability to realize what messages are more questionable and the skill to hypothesize about the objectives of those who create or share social media messages, would be highly valuable. However, developing those skills among different groups of people in the society is not easy and no short-term plan would make them possible. Promoting skepticism in the society about media messages, on the other hand, can be carried out more speedily and people with different education backgrounds and social levels can learn how to be more skeptical about the messages they receive.

Schools, universities, media and NGOs concerned with public knowledge and ignorance, should put their efforts into increasing people's critical thinking and media literacy. In an increasingly commercialized world in which financial interests are becoming the first priority even for the universities (Friedrichsen et al., 2017) this can be a greater challenge. As a short-term plan, however, arguably increased skepticism can prevent a part of the harm that can be resulted from the flow of unreliable information. As suggested before, when it comes to messages received via social media, researching some and ignoring many can be a safe strategy.

Promoting this kind of skepticism - if enough effort is dedicated - should not be a huge challenge. People can be provided with samples of messages including wrong or inaccurate information about social, economic, health-related, and other issues. Showing how audio, photo and even video messages can be misleading and fake can be helpful. Also revealing the truth about popular wrong messages which many people believe to be true can have a great effect on increasing skepticism among people and encouraging them to ignore or research more before trusting messages on social media.

The current study found evidence that people, even educated ones, lack high levels of critical thinking and they easily believe messages they receive on social media. Arguably in a time when everyone, thanks to the development of the social media, can be a powerful source of information, we are better off ignoring some true and informing messages in return for not littering our brains get packed with hundreds of unreliable pieces of information. Of course, as a second and more advanced plan, the society should be also guided through good ways of researching and evaluating the information it faces on a daily basis.

Five out of the 12 messages shared on the study's questionnaire gained the trust of more than 90 percent of the respondents. We think it is safe to claim that this is evidence enough for the naivety of people as far as the social media messages are concerned; especially bearing in mind that the respondents are university students.

Three other messages were trusted by over 70 percent of the respondents. Even if a message sounded highly suspicious to our respondents, in no case less than 36 percent of them assumed it to be true.

Even the messages that were not assumed to be true by high numbers of respondents could be considered as evidence for people's uncritical minds. Nearly 60 percent of the respondents believed the message about the aliens and only about 47 percent of them believed the one about the remains of a mermaid. However, considering the oddity of the claims presented by these messages (e.g. aliens have traveled to the earth in the past centuries and a beautiful woman with a fish tail exists) those percentages seem considerably high.

One who is familiar with Iranian culture can argue that some of the messages are closely related to popular myths that many Iranians hold: Iranians are very smart and they have very high IQs and the world is impressed by Iran's history and its historical monuments. Interestingly at the same time, many Iranians are critical of their people's *underdeveloped culture* when it comes to rushing to eat a sandwich or littering historical sites while they think "foreigners" don't do that and they might even come to Iran and start cleaning up litter from a historical site.

These findings support the hypothesis that if a message supports a previously held opinion or interest it will be subject to less critical thinking and doubt. In other words, if a message implies something that you think is true or you like to be true you are more likely to accept it without questioning its factuality.

As an example, if you believe that Iranians are exceptionally smart when you read a message saying an Iranian Professor was given Albert Einstein's seat after it was empty for half a century you are less likely to doubt it and ask: how come that seat was empty for five decades? Einstein was a university professor; why would the university leave his position empty for such a long time? Were none of the annual Nobel Prize Winners in physics qualified to teach physics at that university?

Future research can use creative ways to extract popular themes that undermine people's critical thinking and skepticism. Moreover, the effects of such themes on the reactions of the audiences can be examined.

A NOTE ON GENERALIZABILITY

We chose 12 messages among thousands of messages with hundreds of different themes. We do not have statistically valid information to claim that the 12 messages are representative of all messages that flow through social networks. If we replace the messages with others, the results could change.

Also, we deliberately chose messages that we considered *hard to believe*. We considered the hardest message to believe to be the one about the discovery of the remains of a mermaid. If we had chosen messages that were easier to believe, the results could be even more disappointing.

LIMITATIONS OF THE STUDY

Even though 379 people filled the questionnaire - which makes generalization possible - the valid data for each of the 12 messages is well below that number. The reason is that the respondents were not directly asked whether or not they believed the messages. Instead, they were asked to write a comment on each message using which the researchers tried to understand if they had believed the messages. This meant hundreds of hours of extra research work and more complications, but it seemed to be necessary.

The comments provided by some of the respondents clearly showed that they did not doubt any of the 12 messages. But if each message came with a sentence asking *do you think this message is true* the respondents would have known that at least some of the messages where false and they would tend to cast some doubt. That is not what happens while people naturally surf the internet. The study tried to recreate that natural environment.

As a result the coders did not have the respondents' self-report and had to make a judgment on whether a respondent believed a message. In such a case an obvious rule would be that the coders should not be allowed to read too much into the respondents' comments and other than "believed" and "not believed" there should be an option *unclear* for the likely case where the respondent's trust or doubt is inconclusive. As a result, the number of valid responses for each message varies from 155 to 216, which significantly reduces the valid sample size.

Another issue is the fact that this study was largely based on descriptive rather than inferential statistics. As explained, despite the large literature on media literacy and related concepts such as fake news, there is not much information on the amount of false information that is being shared on the internet or how different groups of people react to them. As we have not developed scientific measuring references any judgment on whether or not someone is uncritical to critical enough toward online messages remains descriptive, and somewhat subjective. This study should be considered a preliminary work before more systematic research is done in the future.

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Shaho Sabbar · Alireza Abdollahinezhad · Ako Heidari · Fatemeh Mohammadi
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