Analyzing the Semantic and sociolinguistic Patterns of Rumor in the Iranian Context: A Content Analysis of Social Media Rumors

Mohammad Aliakbari[1] [iD] |**Afsaneh Shokri[2]** [iD]

[1] Professor of TEFL, Ilam University, Ilam, Iran. (Corresponding Author)
E-mail: m.aliakbari@ilam.ac.ir
[2] Lecturer, Ilam University, Ilam, Iran. E-mail: shokri19@yahoo.com

Article Info	ABSTRACT
	Rumors, as archaic forms of communication, emerge in uncertain and threatening situations. The present study analyzed 407 rumors collected from Iranian social media to explore their primary motivations, subjects, as well as their supported and targeted groups. The results of the content analysis revealed that in addition to hostility, fear, hope, and curiosity proposed by Knapp (1944) and Allport and Postman (1947b), two new rumor motivations were specific to the Iranian context. The "supportive" rumors supported a particular entity, and "us vs. them" rumors combined supportive and hostility motivations. Concerning the subjects of rumors, politics, religion, people, culture, quality of life, events, and terrorism were the 7 overarching subjects identified. The results also revealed that hostility was the most common motivation for rumor-mongering. Findings also made it clear that Islam and the Islamic Republic of Iran were respectively the prominent supported and target groups of rumors. Data also made it clear that the type and frequency of the rumor motivations varies depending on the context and society wherein rumors pass along. Several implications and contributions are further discussed in details.

Publisher: University of Kurdistan.

1. Introduction

Rumors, as a persistent feature of social and organizational environments, (DiFonzo& Bordia, 2007) are both out-of-date and, at the same time, up-to-date (Osetrova, 2013). They are the antiquated form of communication and mass media (Manaf, Ghani & Jais, 2013) and pervade the whole society (Oyewo, 2009) like dust (Manaf et al., 2013) or the air (Rosnow, 1988). According to the common view among scholars, there is no universally accepted definition for this phenomenon. The disagreement may arise from the nature of rumor, as it 'does not leave any trace' (Bordia &DiFonzo, 2004: 33).

Due to the importance of rumors in society, this study analyzed subjects and motivations for rumors in Iranian social media. The following sections explored various definitions of rumor, its classifications and characteristics. Then the related literature and methodology are reviewed. Finally, the results are discussed in detail and some implications and suggestions are provided for interested researchers.

People are curious by nature and interested in obtaining information naturally (Palen, Vieweg, Liu & Hughes, 2009). During sensational events and emergencies, they use different sources to obtain information. However, because of the ubiquitous presence of social media all around their lives, people tend to rely more on these sources (Palen et al., 2009). Iranian people widely use social media networks. Recent surveys suggest that about 72% of Iran's population between 18 to 29 have access to smart phones and that 42% of people living in rural areas have access to social networks, making it increasingly easy for anyone to disseminate content to a broad audience (Dehghan, 2017). Nevertheless, not all information disseminated in social media is authenticated by credible sources (Kwan & Bang, 2016). Some information may be wholly inaccurate or rumors.

As social events (Prasad, 1950), rumors are the *inseparable parts* of social media and can affect public opinion (Kelley, 2004). They can be considered treasures that provide insights into the underlying perceptions, anxieties, and problems of people in a society. In other words, rumors are yardsticks to gauge public opinion (Kelley, 2004) and represent society's most important concerns and anxieties. Moreover, rumors cause misunderstandings and negative emotions. They can impede the effective utilization of accurate informational content on social media (Budak, Agrawal, &Abbadi, 2011). Accordingly, there is an urgent need to better understand the nature of rumor, its transmission, and the motivations behind this crucial social media component.

Despite the significance of the rumor, little attention has been paid to investigating its origin, distribution, and explanation in the Iranian context.

Accordingly, the present study attempted to analyze the rumors circulating in Iranian social media to identify their motivations, subjects, and targets. In particular, it attempted to answer the following questions:

1. What are the main motivations and theprimary subjects of rumors in Iranian social media?
2. What are the targeted and supported groups of rumors in Iranian social media?

1.1 Defining Rumor

Knapp (1944) defines rumor as a "proposition for the belief of topical reference disseminated without official verification" (p. 22). Shibutani (1967) regards it as a collective problem-solving endeavor explaining an unexplained event. Rosnow (1988) defines rumor as a process of seeking information and expressing stress and tension in society, which can predict people's behavior in ambiguous contexts. He suggests that four conditions affect and even predict rumor generation and transmission in the society: anxiety, uncertainty, credulity, and the outcome relevance of rumors (Rosnow, 1988).

According to Rosnow (1998), rumor is a public communication reflecting the assumption of people who try to make sense of how the world works. Osetrova (2013) considers it as a speech genre designing and transferring unverified information in society. By his definition, the main objective of this genre is spreading unauthorized information, which is initially in oral form. DiFonzo and Bordia (2007) provide a more comprehensive definition of rumors in terms of the content, context, and functions. In their perspectives, a rumor as anonymous information emerges in uncertain and threatening situations and helps people manage and reduce their anxieties and stress. DiFonzo, Beckstead, Stupak, and Walders (2016) confirm DiFonzo and Bordia's (2007) definition of rumors and added that the senders of the rumors might be aware of the uncertainty of their information.

1.2 Classification and Characteristics of Rumor

After World War I, some German and American Psychologists tried to develop a typology for rumors (Osetrova, 2013). However, the most popular classification system was provided by Knapp (1944). According to him, most rumors can be classified as wish, fear, and hostility. Wish or pipe-dream rumors are those that reveal the wish or desire of people who spread them. Fear or bogey rumors express the fears and anxieties of the people in society. Hostility or aggression/wedge-driving rumors create aggression toward other groups (Kelley, 2004). Further, Allport& Postman

(1947a) consider curiosity rumor or pseudo-news and define them as information that carries no stocktaking. Nkpa (1975) also adds another type of rumor to the classification and calls the new type Neo-Pipe-Dream. He defines it as a combination of hope and fear rumors.

Regarding the characteristics of rumor, Knapp (1944) identifies three fundamental features: transmission by word of mouth, provision of information, and the satisfaction of the emotional needs of the society. Shibutani (1967) emphasizes that the rumors are characterized by how intensely they spread. In other words, more plausible rumors are those that spread widely. DiFonzo and Bordia (2007) argue that the main characteristic of the rumor is that it is not verifiable at the time of spreading.

1.3 Differences between rumor, gossip, news, and urban legend

Due to their relatively equal distribution and blurred borderlines, rumor, gossip, news, and urban legend may not be clearly distinguished. However, DiFonzo and Bordia (2007) argue that rumor and gossip are not equivalent. In their perspective, gossip is an "evaluative talk" (p.19) about the lives of the individuals in the society and serves various purposes such as building relationships, maintaining social groups, entertaining, etc. According to Coast and Fox (2015), gossip circulates in small groups of people who have a shared history or interest (Rosnow& Foster, 2005). Foster and Rosnow (2005) distinguish rumor and gossip in three aspects. A rumor remains unverified, while gossip may or may not be firmly verified. A rumor is topic-related and holds importance to its participants, whereas gossip is not considered, being populated more urgently. Contrary to gossip, a rumor may or may not be about the personality of individuals.

Rumor also differs from other forms of talk, such as news and urban legends. DiFonzo & Bordia (2007) compared rumor, gossip, urban legends, and news in six hypothesized information dimensions. They summarized these hypotheses in Table 1 in detail.

Table 1. Categorization of Rumors, Urban Legends, Gossip, and News

	Evidentiary basis	Perceived importance by participants	Content about Individual	Contents slanderous	entertaining	Perceived importance by participants
Rumor	L	H	L/M/H	L/M/H	L/M/H	H
News	H	H	L/M/H	L/M/H	L/M/H	H
Gossip	L/M/H	L	H	H	H	L
Urban legend	L	L	L/M/H	L/M/H	H	L

Note L/M/H: Low/ medium/ High. Adapted from *Rumor psychology: Social and organizational approaches* (p.27), by DiFonzo and Bordia (2007). Washington, DC: American Psychological Association

Overall, a rumor is used to explain an ambiguous context to make sense of it (Manaf et al., 2013) and manage threats because it has social influence (DiFonzo& Bordia, 2007). DiFonzo, Bordia, and Rosnow (1994) also regard its functions as clarification and emotional expression. Xia & Huang (2007) assert that rumors affect and shape public opinion and measure people's opinions (Kelley, 2004). Difonzo and Bordia (2007) consider other secondary functions of rumor as 'entertainment, wish, alliance making and enforcement of communal rumor' (p. 15).To sum up, a statement can be called a rumor with reference to the following three criteria:

a. verification: rumor is an unverified statement
b. public interest: rumor is a statement that is of public interest
c. function: rumor is a statement used for sense-making in threading and ambiguous situations (Difonzo and Bordia, 2007)

Because of their importance, rumors have been studied in different areas such as sociology, social psychology, philosophy, semiotics, political technology, and advertising and management (Osterova, 2013). Though many investigations have been conducted to study rumors in different societies and contexts, Iranian society has received tertiary attention for rigorous studies. Due to the few studies conducted on the rumors, this study aimed to explore the classification and the motivations behind rumors in Iranian social media from sociolinguistic perspective.

2. A brief note of previous works

The scientific study of rumors began after World War I (Osetrova, 2013). Later, Allport and Postman (1947b) analyzed the nature of rumors to understand their effects on both troops and civilians during World War II. They proposed the fundamental law of rumors. Allport and Postman (1947b) proposed "importance and ambiguity" (p. 502) as two conditions necessary for the rumor.

In his seminal study, Knapp (1944) analyzed about 1089 rumors sent to Reader's Digest from across the United States, collected by the Massachusetts Committee during September 1944. He utilized his three-fold classification (fear, hope & hostility) to analyze the rumors. His findings indicated that hostility was the most frequent type of rumor (more than 65%) targeted against the United States administration or Military.

A few years later, Nkpa (1975) investigated the conditions, customs, and beliefs that affected the rumors about mass poisoning during the civil war (Known as the Nigerian civil war) in Biafra State. It was claimed that the Nigerian air force spread poison in the sky during the Nigerian civil war, resulted in kwashiorkor among people. Nkpa (1975) analyzed 121 rumors before, during, and after the war. Of the 121 collected rumors, only five (4%) were poison rumors. He attributed the low incidence of the mentioned rumors to the cultural backgrounds and beliefs. Nkpa (1975) asserted that Biafran people believe in reincarnation (starting a new life after death), and they also believe that people who died of poison would never be reincarnated, which means they would be extinct, which is against their cultural beliefs.

Bordia and Rosnow (1998) investigated the structure of rumor transmission chains in computer-mediated communication (CMC). They tried to investigate a rumor about the Prodigy service, an online information service. In 1991, a rumor was circulated that Prodigy is tapping subscribers' hard devices. Bordia and Rosnow (1998) analyzed 47 posts of 30 people in a CMC discussion group for 6 days. The results confirmed that rumors are a problem-solving process. It also proved that the CMC patterns were similar to face-to-face group discussions.

Using Knapp's (1944) typology, Kelley (2004) analyzed 966 rumors published in Baghdad Mosquito, an intelligent document published by the US military in Iraq. She used 'fear, wish, and hostility' categories and found that 70% of rumors fell into the hostility and fear categories. She also detected the primary target of each rumor: anti-US and Coalition, anti-Iraq, anti- Iraqi administration, anti-Sadam, anti-Kurd, anti- Shi'a, anti-Sunni, anti-Iran, anti- Zionist, and anti-terrorists. Moreover, Kelly (2004) tried to identify the subject of each rumor. She found that the rumors were placed into one of the 8 top categorized subjects: governmental/political, quality of life, insurgency, security, terrorism, military, communication, and detainees. She concluded that studying rumor motivations and subjects could pave the way to win the battle for hearts and minds in Iraq.

With the Emergence of the Internet and social media and their easy accessibility and high availability (Palen et al., 2009), the creation and propagation of information entered a new era. Internet and social media

have contributed significantly to the circulation of true and false information since these media permeate everyday life and become pervasive. At the same time, the mechanisms for controlling the quality of their information remain less structured (Oh, Kwon, & Rao, 2010).

A good number of researchers investigated the propagation of rumors through social media. Some examples are reviewed below. Marett and Joshi (2009) examined the extrinsic and intrinsic motivations of online community members for sharing information and rumors. Participants fell into two groups: posters (who posted their thoughts) and lurkers (who only read the postings). The results indicated that posters and lurkers had different intrinsic motivations for sharing. Moreover, motivations like improving reputation and status-building are extrinsic rewards for rumor-mongering among community members.

Mondoza, Poblete, and Castillo (2010) analyzed the behaviors of Twitter users before and after the 2010 earthquake in Chile. They tried to investigate the propagation of rumors in social networks and the ability of their users to discriminate between confirmed and false rumors. The results showed the propagation of rumors and confirmed that the news was different. More than 95 % of readers validated the tweets which provided true information and questioned the false information.

After the 2008 presidential election of the United States of America, Garrett (2011) surveyed to investigate the Internet's influences on rumoring. In a Random-Telephone- Survey, he asked the respondents to mention 10 rumors circulating via E-mail during the 2008 presidential election. The results revealed that using the Internet results in more rumors. It also showed that the Internet affects people's beliefs; however, its impact is indirect and trivial.

Using microblogging, Starbird, Maddock, Orand, Achterman, and Mason (2014) investigated misinformation correction. They explored three rumors about the 2013 Boston Marathon Bombing circulated on Twitter after the incident. The results showed that although the corrections of misinformation emerged, they were muted.

Simon, Goldberg, Leykin, and Adini (2016) investigated the spreading of information through WhatsApp during a kidnapping of three teenagers in Israel. They explored how true and false information circulates through WhatsApp using a web-based survey. They were also interested in identifying rumor initiation and propagation paths. The finding suggested that 9 out of 13 rumors regarding kidnapping were verified later. It also revealed that 61% of 419 respondents had received information through WhatsApp. In this research, the authors identified the source of only two rumors. Accordingly, they concluded that detecting the source of rumors

was very demanding, and locating rumors in real-time might help detect their sources.

Oh et al. (2010) used a content and semantic network analytic approach to study rumors spreading during the saber-rattling between South and North Korea in 2013. They focused on wedge-driving (hostility) rumors on Twitter. After filtering out the irrelevant messages, they analyzed 2532 tweets. 36.4% of messages were categorized into the wedge-drive group. The results asserted that wedge-driving rumors revealed some kinds of intergroup hostility and could threaten domestic stability during the crisis.

Through a survey of 2424 individuals who used social media during the covid pandemic, Guo et all (2023) found that information acquisition from social media had a negative relationship to rumor sharing and that rumor belief mediated this relationship. They also maintained that acquisition of information from traditional media weakened the negative effect of information acquisition from social media on rumor belief. Meanwhile, critical thinking was found to alleviate the positive effect of rumor belief on rumor sharing.

Jahanbakhsh-Nagadeh et al (2023) proposed a model to measure the spread power of rumors. They came to the conclusion that "(i) the spread power of False Rumor documents is rarely more than True Rumors. (ii) there is a significant difference between the SPR means of two groups False Rumor and True Rumor. (iii) SPR as a criterion can have a positive impact on distinguishing False Rumors and True Rumors" P 13787.

In line with the aforementioned studies and due to the importance of rumors in social media, the present study analyzed motivations and subjects and their main themes in Iranian social media. In the coming section, the corpus of the study and different stages of the procedure (the used classification schemes of motivations and subjects, pilot study, and coding consistency of the used classifications) are explained.

3. Methodology
3.1 Corpus
The data for this study consisted of rumors collected from an online fact-checking website, Shayeaat (https://www.shayeaat.ir), which publishes and analyzes rumors on various topics circulating in the Iranian context. This website was chosen as a reliable source of data for two reasons: first, it was publicly available and covered a wide range of subjects that were relevant to the research questions; second, it employed experts to collect, analyze, and validate the rumors using multiple sources of evidence (Mehrnews, 2015).

The data collection process began with retrieving all the rumors posted on the website from January 2015 to August 2016, which was the available time span at the time of data collection. This yielded a total of 576 rumors. Next, the rumors were filtered according to the three criteria (verification, public interest, function) proposed by Difonzo and Bordia (2007) to distinguish between rumor, gossip, news, and urban legend (see section 1.3). Based on these criteria, 170 statements that did not qualify as rumors were excluded from the data set. Finally, the remaining rumors were checked for duplicates using manual inspection and a software tool, and only the first occurrence of each rumor was kept. This resulted in a final data set of 406 rumors. It should be noted that the rumors were classified under 6 subjects on the website: i. individuals, ii. Policy, iii. History, iv. Science & Technology, v. Religion, and vi. Society & Culture. At first, the researchers intended to collect the rumors according to their subjects; however, it was revealed that sometimes the same rumor was grouped under different classifications simultaneously. Therefore, the rumors were classified by their date of posting on the website, rather than their subject, to avoid overlapping categories.

3.2 Procedure
3.2.1 Classification Scheme
Although there is no single or universally accepted classification system for rumors (Kelley, 2004), Knapp's classification scheme (1944) is perhaps the most widely usedscale in various contexts. Knapp (1944) categorizes rumors according to their subjects: hostility, fear, and wish. Later, Allport and Postman (1947b) considered Knapp's classification oversimplified because sometimes it fails to capture one motivation behind any given rumor. They added curiosity rumor to his list. Despite such revisions, Knapp's (1944) scheme still requires more comprehensive and updated model that accounts for the diversity of rumors in different settings. Yet, to base the present research on a sound classification scheme and improve the available models, a pilot study was conducted to present a more comprehensive model for the subjects and motivations of rumors in the Iranian context.

3.2.2. The Pilot Study
A pilot study was conducted to examine the applicability and adequacy of the Knapp (1944) classification. A sample of 80 rumors from different months was selected randomly and analyzed using both inductive and deductive approaches. The analysis consisted of three steps. First, the rumors were coded using the existing categories proposed by Knapp's

(1944) (hostility, fear, wish) and Allport and Postman's (1947) (curiosity); second, the rumors that did not fit into the initial categories were identified and new categories were created accordingly; third, the rumors were compared and contrasted within and across the categories for further refinement. Data analysis in pilot study showed that in addition to previous categories, two more types of rumors existed in the Iranian context: supportive rumors and 'us vs. them' rumors. These types were not covered by previous classifications and were defined by the authors of the present study as follows:

'Supportive' rumors are those that aim to endorse or praise an individual, group, or entity. They usually attribute extraordinary powers, actions, or qualities to the target of support. For example, attributing extraordinary abilities and knowledge to Mohammad Reza Pahlavi (the late King of Iran before the revolution) was a way to express support for him. Supportive rumors can be seen as a form of social identity enhancement, as they can boost the self-esteem and pride of the supporters (Tajfel, 1982).

'Us vs. them' rumors are those that involve a comparison or contrast between two individuals, groups, or entities, with the intention of favoring one and disparaging the other. They usually highlight the differences or conflicts between the two sides and use evaluative or emotional language to express support or hostility. In other words, they are a combination of hostility and supportive rumors. An example of 'Us vs. them' rumor is comparing the meaning of Iranian and Arabic names to boost the Iranian culture before Islam and denigrate the Islamic culture. This type of rumor can be observed as a form of social identity threat, as it develops the in-group sense and enhances negative prejudices and stereotypes towards out-group (Tajfel, 1982).

The pilot study also showed that some rumors had multiple motivations and could not be easily classified into one category. For instance, a rumor about factories and brands could be motivated by fear or hostility, but if the name of the factory or brand was mentioned in the rumor, it was considered as hostility rumor. A case in point was a rumor that Fanta soft drink (a popular brand in Iran) is infected with various viruses. This rumor was classified as hostility.

Moreover, the pilot study helped to identify the subject and targeted groups of rumors in Iranian social media. A close examination of the subjects revealed that although some rumors could belong to more than one subject, each one had "enough distinguishing characteristics" (Kelley, 2004, p.23) to justify its existence. Therefore, the most salient features of rumors were utilized to place them in the subject typology. The analysis

indicated that the rumors could be grouped in 7 main subjects: Politics, Religion, People, Terrorism, Quality of life, Events, and Culture.

Regarding the targeted groups of the rumors, the following definition was utilized: "Rumors were considered to be targeted if the antagonist of the rumor was identified, either explicitly or by making references that could be attributed to a specific group" (*Kelley, 2004,* p. 22). Accordingly, 10 targeted rumors were identified as follows: IRI, Islam, Arabs, Afghans, Fundamentalists, companies, ISIL, Jundallah, culture, and US administration. It should be noted here that since supportive rumors were specific to Iranian context, it was also decided to analyze the supported groups in Iranian social media. A group was considered to be supported if the primary motivation of rumor mongers was attributing positive characteristics to it.

Overall, following Knapp (1944) and Allport and Postman (1947b), previous studies, Tajfel (1982) contribution and the pilot study results, the present study adopted an extended and modified classification for the rumor motivations. The modified typology included:

 a. Hope
 b. Fear
 c. Curiosity
 d. Wish
 e. Support, and
 f. Us vs. Them (see 1.2 & 4.2.2 for their definitions)

Concerning the subjects of rumors, the following primary subjects and their main categories were identified in the pilot study:

 1. Politics:
  a. Islamic Republic of Iran (IRI): the nature of IRI, its general principles, the Leader, government institutions, corruption, and its policy toward Iranian people and the world
  b. Political Groups: Iranian political parties inside Iran and political parties in exile, their relationships, and conflicts

 2. Religion:
  a. Islam: the nature of Islam as the official religion of Iran, the central Islamic beliefs, laws, practices
  b. Zoroastrianism: The pre-Islamic religion in Iran

 3. People:
  a. Iranian People: The Iranian before and after Islam, the Iranian before and after the Islamic Revolution, celebrities and ordinary people
  b. Other Countries' people: e.g., Arabs, Afghans

4. Quality of life:
    i. Economy: economic conditions in Iran and in the world and its main sectors.
    ii. Health: the contamination of water and food supplies and discovery of new medicines
5. Events: consisted of rumors about natural disasters such as earthquakes or floods and extraordinary events such as an asteroid will hit Earth
6. Culture: referred to rumors about the glorious culture of Iran before Islam and comparing it with Islamic culture and the current culture of Iran. Moreover, it included rumors about some negative cultural behaviors of Iranian people
7. Terrorism:
    a. ISIL: rumors about the ISIL (The Islamic State of Iraq and Levant) and their activities against Iranian people and the government, such as poisoning water supplies.
    b. Jundallah: rumors about suicide bombing attacks by its members

Regarding the targeted groups of the rumors, the following definition was utilized. 'Rumors were considered to be targeted if the antagonist of the rumor was identified, either explicitly or by making references that could be attributed to a specific group' (*Kelley, 2004,* p. 22). Accordingly, 10 targeted rumors were identified. They were IRI, Islam, Arabs, Afghans, Fundamentalists, companies, ISIL, Jundallah, culture, and US administration. Overall, the supported groups were IRI, the Reformists, culture, the exiled prince, Iranian physicians, and Zoroastrianism.

3.2.3. Rating the coding classifications

To assess the reliability of the coding classifications for the motivation typology and subjects of the rumors and targeted and supported groups categories, the researchers invited five Ph.D. students in Applied Linguistics and then selected two students who had the most harmony and unity of procedures. The researchers and the students were native speakers of Farsi and were in the same university. The students armed with detailed guidelines attempted to categorize a sample of 80 randomly selected rumors. The results showed that coding consistency was 87% for the motivation typology and 95%, 91, and 90% for subjects of rumors, targeted groups, and supported groups, respectively.

4. Results

4.1. The Rumor Motivations and subjects

To answer the first question, the frequency and percentage of each rumor and their primary subjects were computed. Table 2 represents the results.

Table 2. The frequency of different types of rumor motivation and their subjects in Iranian social media

Primary subjects							
Rumors **F (%)**	Politics	Religion	People	Culture	Q of life	Terrorism	Events
Hostility **187 (46)**	82	49	33	4	17	2	-
Supportive **63 (16)**	20	21	-	18	-	-	4
Fear **62 (15)**	7	-	-	-	15	26	14
Curiosity **54 (13)**	-	-	36	3	-	-	15
Wish **26 (6)**	-	10	-	-	14	-	2
Us vs. Them **15 (4)**	-	-	5	10	-	-	-
Sum **407 (100)**	109(26.5)	80(20)	74(18)	35 (8.5)	46(11)	28(7)	35(9)

Note F: frequency, %: percentage, Q: Quality

As Table 2 shows, of the total rumors, hostility was by far the most frequent type of rumor (46%), followed by supportive (16%), fear (15%), and curiosity (13%). The least used types of rumors were wish and 'us vs. them' rumors, with a slightly higher percentage for the former (6%, 4%, respectively). Regarding subjects, 'politics was the most frequent in Iranian social media (26.5 %). More than 95% of political rumors were about IRI (78 out of 83), and the rest targeted Iranian political groups. Religion was the second frequent subject. Islam, the official religion of Iran, was the subject of more than 18% of rumors, followed by Zoroastrianism(2%), the ancient Iranian religion. The 'people,' as the third frequent subject (18%), consisted of rumors about Iranian and other countries people. The 'quality of life' contained 46 (11%) rumors about economic (7%) and health issues (4%).'Terrorism' and 'events' were the

least attracted subjects in the Iranian context (9% & 7%, respectively). 'Event' rumors were mainly about natural events, and the 'terrorism' rumors mainly targeted ISI. The categories of each subject are presented in Table 3 in detail

Table 3. Different categories of the rumor subjects and their motivations in the Iranian social media

Subjects	Hostility		Support	Fear	Curiosity	Wish	Us vs. Them	F (%)
Politics	IRI	78	3	-	-	-	-	81(20)
	Groups	4	16	7	-	1	-	28 (6.8)
Religion	Islam	49	18	-	-	10	-	77(19)
	Zoroastrianism	-	3	-	-	-	-	3(.5)
People	Iranian	-	-	-	36	-	5	41(10)
	Other countries	33	-	-	-	-	-	33(8)
Culture		4	18	-	3	-	10	35(8.5)
Events		-	4	14	15	2	-	35(8.5)
Q of life	Economy	17	-	4	-	7	-	28 (7)
	Health	2	-	9	-	7	-	18(4)
Terrorism	ISIL	2	-	25	-	-	-	27 (7)
	Jundallah	-	-	1	-	-	-	1(0.2)

NoteF: frequency, %: percentage, IRI: Islamic Republic of Iran, ISIL: *Islamic State of Iraq and the Levan*

4.2 The targeted and supported groups in Iranian social media
To answer the second question of the study, all targeted and supported groups were detected. Table 4 and 5 represent the results.

Table 4. Targets of the rumors, their main motivations, and subjects in Iranian social media

Target F (%)	Rumor motivations		Subjects					
	Hostility	Fear	Pol	Q	Rel	Terror	Cul	Ppl
IRI 95 (40.5)	88	7	88	7	-	-	-	
Islam 49 (21)	49	-	-	-	49	-	-	
Arab 30 (13)	30	-	-	-	-	-	-	30
Afghans 3 (1)	2	1	-	-	-	-	-	3
Fundamentalists 11 (5)	4	7	4	7	-	-	-	-
Companies 8 (3)	2	6	-	8	-	-	-	-
ISIL 27 (11)	2	25	-	-	-	27	-	-
Jundallah 1 (0.5)	-	1	-	-	-	1	-	-
Culture 4 (2)	4	-*	-	-	-	-	4	-
US 7 (3)	7	-	-	7	-	-	-	-
Total 235 (58)	188	47	92	29	49	28	4	33

Note Pol: Politics, Q: Quality of life, Rel: Religion, Terr: Terrorism, Cul: Culture, Ppl: People

Table 5. Supported groups, their main rumor motivation and subjects.

Groups F (%)	Motivations					Subjects		
	Sup	wish	Pol	Q	Rel	Ter	Cul	Ppl
Islam 28 (31.5)	18	10	-	-	28	-	-	-
Culture 18 (20)	18	-	-	-	-	-	18	-
Reformist 18 (20)	10	8	10	8	--	-	-	-
Exiled prince 8 (9)	7	1	8	-	-	-	-	-
Iranian physicians 7 (8)	-	7	-	7	-	-	-	--
Iranian people 4 (4.5)	4	-	-	-	-	-	-	4
IRI 3(3.5)	3	-	3	-	-	-	-	-
Zoroastrianism 3(3.5)	3	-	-	-	3	-	-	-
Total 89(100)	63	26	21	15	31	-	18	4

Note Sup: support, Pol: Politics, Q: Quality of life, Rel: Religion, Terr: Terrorism, Cul: Culture, Ppl: People

As Table 4 shows, out of 407 rumors, 235 rumors (58 %) targeted different groups and entities in Iranian contexts. The primary motivations of these rumors were hostility (about 80%) and fear (20%). The most frequent target was IRI (40%), followed by Islam (21%) and Arabs (13%). Jundallah and Afghans were the least targeted groups in Iranian social media. According to Table 4, the targeted groups were mainly from the categories of politics (more than 34%), and religion (21%). It seems that culture was the least interested subject to be targeted by rumors (less than 4 %).

As Table 5 indicates, 8 groups were supported by 21% (89) of rumors in Iranian social media. Moreover, the rumor mongers utilized supportive (16%) and wish (6%) to support their groups. They mainly supported Islam (31%), reformists (20%), and culture (20%). The supported groups mainly belonged to religion (35%), Politics (24%), culture (20%), and quality of life (17%).

5. Discussion

5.1 Rumor motivations and primary subjects

This research examined rumors circulated in Iranian social media and identified the main motivations. The result revealed that the most prevalent motivation in Iran was hostility followed by support, fear, curiosity, wish and us vs. them, respectively. The findings were in line with some of the existing literature on rumor motivations, such as Knapp's (1944) and Kelley's (2004) studies. However, it revealed some new and unique aspects of rumor dynamics in Iran, such as the emergence of supportive and us vs. them rumors. It seems that these motivations were influenced by factors such as culture, history, and policy that shape the society and the relationship in Iranian context. They also reflect the complex and diverse nature of the Iranian social identity and its implications for the public opinion, perception, and behavior of the people.

5.1.1 Hostility rumors

Concerning hostility motivation, the result was consistent with Knapp's (1944) conclusion, which states that more than 60% of all rumors fall in the hostility category. He called this category wedge-driving because their primary purpose is to end the allegiance and loyalty in the groups and spread frustration. According to him, Hostility rumors prove the existence of a 'scapegoating mentality' in society (Knapp, 1944, p. 33).

The primary subjects of the hostility rumors were political issues (44%), mainly consisting of rumors about the Islamic Republic of Iran (focusing on the government and the officials). The findings paralleled Knapp's (1944) and Kelly's (2004) studies. Knapp found that the hostility

rumors in the US had predominantly targeted the US administration. According to him, the targets of the hostility rumors are often in-group. In her study, Kelly observed that 26% of the rumors in Iraq targeted 'Government/Political' issues which were a little above the results in this study. Kelly pointed out that hatred and aggression against out-groups and the obvious enemies are expressed very openly and directly, not in rumor. Therefore, the wedge-driving rumor targets individuals or groups in the same group. The subject of about 8% of rumors was 'the Iranian political groups.' Unlike rumors in the 'IRI' category, in which hostility was their main motivation, the primary motivation was 'support' in 'the Iranian political groups' category. It seems that each group and their supporters tried to make a positive feeling about their group and create self-enhancement.

The second frequent subject was religion. Most Iranian people are Muslim (more than 99%), and Islam permeates nearly every aspect of their lives. Prasad (1950) stressed that rumors are social phenomena and the necessary conditions for their existence are their importance or relevance to people's lives. Rosnow (1988) called this condition outcome-relevant involvement. The tertiary subject was 'people.' Hostility rumors were mainly targeted Iranian people and people from other countries, especially Arabs (i.e., Palestinians, Saudi Arabia, &Iraq). Following the Iranian Revolution, the Islamic Republic of Iran had terminated its political relations with Israel and openly supported Palestine. The findings suggested that some Iranians are against the financial and political state support given to Palestinian groups. In the second tier, targets of the Anti-Arabic sentiment were Saudi Arabia (Iran and Saudi Arabia relationships have declined after the Iranian revolution and further deteriorated during the Syrian War) and Iraq (despite the post-war alliance of the two countries). Two rumors were also found about Israel and Afghanistan. Other targets of the hostility rumors were quality of life and terrorism.

5.1.2 Supportive rumors
Analyzing the collected data, we came across a group of rumors whose primary purpose was to support a particular group, an idea, or something similar. Results indicated that out of 406 rumors, 63 rumors were supportive. The existence of 'support' rumors can be explained by social identity (Tajfel, 1982), which proposes that members of a distinct group are motivated to see themselves higher than others. However, in supportive rumors, the tellers only tried to foster their positive self-image and did not attempt to attribute negative characteristics to out-groups or blame them.

The first subject of supportive rumors was religion, especially Islamic issues such as Shi'a and Shi'a Imams (the successors of the Prophet Mohammad). Some examples were: conversion of Western scientists and astronomers to Shi'a Islam (i.e., it was claimed that Albert Einstein had converted to Shi'a following correspondence with one of the Iranian religious leaders), or a Quran's Ayah (verse) was found on the body of a newborn baby, proving that Islam is God's favorite religion.

In political issues, 'Iranian political groups' comprised over 17% of supportive rumors in Iranian social media. It consisted of two groups: the supporters of the Green movement (a movement that arose after the 2009 Iranian presidential election) and the exiled opposition groups who support the Pahlavi dynasty. Other subjects of supportive rumors were about IRI and different Iranian individuals.

The third subject of supportive rumors was the 'culture' category-Iranian culture, including ancient, pre-Islamic Iran and its historical characters. A clear example of this subtype (which may also be associated with Hostility rumors on a passive level) could be the attribution of miracles and quotes to the royals of ancient Iranian, such as Cyrus the Great (the founder king of the Persian Empire). In this context, it is worth mentioning that Iran's pre-revolutionary Pahlavi Regime had been linking its reign to Cyrus the Great; therefore, it would not be surprising that any positive referencing in the form of (historic) supportive rumor could be perceived as hostility rumor by the Islamic Republic of Iran.

5.1.3 Fear rumors

The motivation behind the 15% of the rumors was fear. The finding was again in line with Knapp's (1944) claim that the percentage of fear as motivation is lower than hostility in rumor-mongering. This statement, however, contradicts Kelley's (2004) finding. Based on her observations in Iraq, Kelly (2004) found that hostility and fear rumors had relatively equal distribution (345& 36% respectively). She believed that the high percentage of fear rumors is a sign of a war zone where the residents' fear and the panic reaction reflected on the rumor motives. It can safely be stated that the current study has verified Kelley's (2004) belief that the percentage of fear rumors would be below the hostility rumors during peacetime.

5.1.4 Curiosity rumors

Results represented that13% of rumors circulated in Iranian social media were curiosity rumors. According to Allport and Portman (1947b), curiosity rumors or pseudo-news are information without value or judgment. In her study, Knapp (1944) found only 6.7% curiosity rumors. Allport and Postman (1947b) attribute the low percentage to their data collection method (asking people to write down and post the rumors they hear). Kelley (2004) found more than 20% curiosity rumors in Iraq. She believed that the primary motivation for transmitting curiosity rumors is fact-finding. However, scrutinizing the topics of the curiosity rumors in the Iranian context revealed that relationship enhancement is the dominant goal.

The main subjects of curiosity rumors were 'people' and 'extraordinary events'. More than 72% of curiosity rumors were targeted individuals (celebrities and ordinary people). Kelley (2004) has pointed out that curiosity rumors do not have apparent or single motivation. According to DiFonzo and Bordia (2007), in short-term relationships, people desire to influence others by positively impacting the audiences. Accordingly, the truth may be sacrificed for goals such as grabbing attention and generating positive effects in the recipients. DiFonzo and Bordia (2007) also believe that sharing information can promote prestige, respect, and status in social media. 'Events' subject consisted of natural disasters such as earthquakes or floods and strange events such as alien invasion. So, the goal of spreading rumors about events was two-fold: relationship building and fact-finding. The relationship-building goal was explained above. Fact-finding motivation is closely related to uncertain situations and a high level of anxiety. When people are suppressed from the information by censorship, their anxiety leads them to generate and transmit rumors to relieve their stress and tension (Kelley, 2004).

5.1.5 Wish rumors

According to Kelley (2004), wish rumors could be a reliable indicator of overall positive morale. The wish rumors are prevalent when people are expectantly looking toward the future. Only 6% of overall rumors fell in the 'wish' category in the present study. Knapp(1944) believed that when people are worried and anxious, fear rumors are more congruent with their emotions. Kelley (2004) has noted that this idea can explain the low percentage of wish rumors.

As Table 2 showed, more than 38% of wish rumors were attributed to religion. This result can be interpreted with the commonplace cultural

behavior of encouraging people to perform religiously motivated acts (i.e., charity, prayers, etc.) in the hope of being awarded good news. Rumors about quality of life, such as financial success or better health conditions, were the other types of wish rumors. According to Kelley (2004), rumors containing wishes or desires may positively affect society in the short term, but they may also increase expectations in the long term. If wish rumors lead to frustration and hostility, they have the same effects as hostility rumors on people.

5.1.6 Us vs. Them rumors

Another new rumor motivation detected in Iranian social media was 'us vs. them' rumors. Out of 406 rumors circulated in Iranian social media,15 (4%) were 'us vs. them' rumors. In this study, these rumors expressed a combination of support toward own group and hostility against other group/s simultaneously. They manifest in a duality format where one part of the rumor praises a specific entity while the other defames or attacks another. 'Us vs. them' rumors can be considered attempts to convince the audience or readers in the Iranian context. A close examination of the 'us vs. them rumors revealed that they often consist of more than five sentences. This result can explain their scarcity in the Iranian context. According to DiFonzo and Bordia (2007), rumors are short one-liner statements and help people make sense of and manage anxiety in ambiguous contexts. So, people prefer to hear information in short statements relevant to their situation (DiFonzo & Bordia, 2007).

In the present study, people and culture were the main targets of 'us vs. them' rumors. Comparing Iranian people and culture, pre and post-Islam and revolution was the subject of 10 rumors in the corpus. The other subject of 'us vs. them' rumors was comparing two individuals to support one and show aggression toward others (e.g., comparing the health ministers before and after the revolution). Similar to 'support' rumors, 'us vs. them' rumors could be correlated with social identity. However, in 'us vs. them' rumors, the rumor mongers attempt to distinguish between in-group and out-group members by attributing positive characters to their group and blaming out-groups.

5.2 The targeted and supported groups of rumors in Iranian social media

5.2.1 The targeted groups

As Table 3 shows, the target of more than 40% of rumors in Iran was IRI. In her study, Kelly (2004) observed that subject of 26% of the rumors in Iraq was Government/Political issues which is a little above the results in

this study. The lower percentage can be explained in terms of the separation of political groups from the IRI category to provide in-depth insight into the politics' categories in the present study. A close examination of the rumors targeting IRI revealed that its overarching themes were mainly concerned with the financial and moral corruption among Iranian government officials and Iran's interference in neighboring countries. The results can be explained in terms of uncertainty or what Allport and Postman (1947b) called ambiguity. According to Rosnow (1988), uncertainty is a psychological condition in a society where people think they are prevented from access to the information because of government ignorance or censorship. In other words, there is an inverse relationship between the level of trust and spread of rumors: when the level of trust in government information decreases, the rumors spreading increases. (DiFonzo, Bordia, &Winterkorn, 2003).

The second most frequent target in the Iranian context was Islam, the official religion in Iran. The surprising point to be mentioned here is that the motivation of more than 96% of rumors about IRI was hostility. Contrary to the claim of the government, the opponents claimed that Islam had not been welcomed by Iranian people but forced onto them. They believed that Iranian people had fought against the Arab invaders who destroyed the glorious pre-Islamic culture and the national identity of Iran. The primary theme of the hostility rumors about Islam was that it was forced onto Iranian people.

'Arabs' were the next targeted group in Iranian social media. The surprising point was that the motivation of all rumors about Arabs was hostility and their main themes were: Arabs hate Iranian people; Iranian people hate Arabs. The rumors in this category are closely aligned with 'the Iranian culture' category and their main goal was self-enhancement. The people who spread such rumors believe that the Aryan race is superior to other races.

11% of rumors targeted ISIL, and their main motivation was fear (about 93%). The primary themes of such rumors were mainly indirect terrorism actions such as poisoning of food and water supplies by ISIL. Another theme was terrorist attacks in Iran. It seems that uncertainty and fact-finding were the crucial conditions and goals for transmitting such kind or rumors. Other targeted groups and their main themes were as follow:

  a. Afghans: Claiming that Iranian people Hate Afghans.
  c. Fundamentalists: Their role in political problems
  d. Iranian companies: Harmful products of companies
  e. Jundallah: Suicide bombing by its members
  f. Culture: Negative cultural behaviors

g.   US administration: Facing severe economic hardships in future due to US sanctions against Iran.

5.2.2 The supported groups

Islam was by far the most supported entity in the Iranian context. It seems that outcome-relevant involvement might explain this high frequency (See 5.1.1). Two themes were evident in the rumors supporting Islam: Islam is the best religion accepted and approved by God; many awards from God are waiting for Muslims.

The next most supported entity was culture. A detailed analysis of these rumors revealed two main themes about Iranian culture: so-called glorious pre-Islamic culture and the glorious pre-revolution culture. It seems that one reason for spreading 'us vs. them' rumors was self-enhancement and rumors mongers tried to make a positive impression about pre-Islamic and pre-revolution Iran to show its superiority to post-Islam/ post-revolution Iran.

Another most supported group was 'reformists', and its main themes were: their positive political attempts and their attempts to remove sanctions or negotiate with the USA government to create better economic conditions.

Other supported groups and their main themes were as follow:

a.   Exiled prince: Returning the exiled prince to Iran
b.   Iranian physicians: Discovery of new medicines for rare diseases
c.   Iranian People: Interesting things about ordinary people or celebrities
d.   IRI: Divine objectives of IRI
e.   Zoroastrianism: A very peaceful religion in Iran and in the world.

6. Conclusion

The present study aimed at analyzing the rumor motivations, the subjects of rumors, the supported and targeted groups and their main subjects, motivation, and themes in Iranian social media. Considering the results and discussion, the following conclusions can be highlighted:

Two new motivations were detected in Iranian social media in addition to hostility, fear, hope, and curiosity. The first motivation was to support a particular group, individual, or entity. So, it was labeled as supportive rumors. The second motivation was called 'us vs. them' rumors since it applied both support and hostility rumors simultaneously. Concerning the frequency of rumor motivations, hostility was the most common motivation in Iranian social media. It was followed by supportive and fear motivations. The least used motivation was 'us vs. them' rumors, the low percentage of which can be explained in terms of their structures.

Moreover, seven main subjects were detected in Iranian social media: politics, religion, people, culture, quality of life, events, and terrorism. The

results showed that two main subjects of more than 40% of rumors were IRI and Islam. It seems that the main reasons for spreading rumors about IRI and Islam were uncertainty and outcome-relevant involvement. The main subjects of Hostility rumors (the most common motivation in the Iranian context) were IRI and Islam (more than 68%).

The major limitation was the number of rumors analyzed (406). This limitation could be addressed in future research by considering a larger corpus from different contexts. Future research could also analyze the structure of rumors with different motivations in different contexts. Comparing the different types of rumors in different contexts and societies is another suggestion for interested researchers.

7. Implications and contributions

The results of the present study may provide valuable information for researchers in the field of sociology, psychology, sociolinguistics, and psycholinguistics who are interested in rumors. Moreover, awareness of the motivations and subjects of rumors in social media can help politicians, sociologists, and psychologists know the primary sources of concerns and anxieties in the context in question and find solutions to prevent rumors in society.

Along with its contribution in enhancing our understanding of the rumors, their subjects, and motivations in the Iranian context, the present study represents an example of contexts in which rumor performs a dual function by supporting or showing aggression toward different groups. This study also emphasizes the crucial role of social media in spreading rumors. Moreover, the results might contribute to the existing literature by revealing how detecting the subject of the rumors can shed light on the most crucial concerns and anxieties in society, and how the type and frequency of the rumor motivation might vary in terms of context and society in which rumors pass along. The above points can be applied and examined in similar or different contexts, especially the existence of support and 'us vs. them' rumors. Synthesizing the results of the present study with the results of other studies in other contexts can shed light on the nature of rumors, main subjects, and motivations and enrich the existing knowledge by providing a more comprehensive explanation of rumors.

References

Allport, G. W. & Postman, L (1947b). An Analysis of Rumor. *Public Opinion Quarterly,* 10(4), 501-517.

Allport, G. W., & Postman, L. (1947a). *The psychology of Rumor*. New York: Henry Holt.

Bagheri, F. (2017, February 4). We even answered the questions of *atheists.* Retrieved from mehrnews.com/xH7KL.

Bordia, P., & Rosnow, R. L. (1998). Rumor Rest Stops on the Information Highway Transmission Patterns in a Computer-Mediated Rumor Chain. *Human Communication Research*, 25(2), 163-179.

Bordia, P., &DiFonzo, N. (2004). Problem solving in social interactions on the Internet: Rumor as social cognition. *Social Psychology Quarterly*, 67(1), 33-49.

Budak, C., Agrawal, D., &Abbadi, A. E. (2011). Limiting the spread of misinformation in social networks. In *Proceedings of the 20th international conference on World Wide Web,* pp. 665-674.

Coast, D., & Fox, J. (2015). Rumor and politics. *History Compass*, 13(5), 222-234.

Dehghan, S. K. (2016). Telegram: the instant messaging app freeing up Iranians' conversations. The Guardian.

DiFonzo, N., & Bordia, P. (2007). *Rumor psychology: Social and organizational approaches*. Washington, DC: American Psychological Association.

DiFonzo, N., Beckstead, J. W., Stupak, N., &Walders, K. (2016). Validity judgments of rumors heard multiple times: The shape of the truth effect. *Social Influence*, 11(1), 1-18.

DiFonzo, N., Bordia, P., &Rosnow, R. L. (1994). Reining in rumors. *Organizational Dynamics*, 23(1), 47-62.

DiFonzo, N., Bordia, P., &Winterkorn, R. (2003). Distrust is a key ingredient in negative rumor transmission. Paper presented at *4th annual meeting of the Society for Personality and Social Psychology, Los Angeles, CA.*

Garrett, R. K. (2011). Troubling Consequences of Online Political Rumoring. *Human Communication Research*, 37(2), 255-274.

Guo, F., Zhou, A., Zhang, X., Xu, X., & Liu, X. (2023). Fighting rumors to fight COVID-19: Investigating rumor belief and sharing on social media during the pandemic. *Computers in Human Behavior*, 139, 107521.

Jahanbakhsh-Nagadeh, Z., Feizi-Derakhshi, M. R., Ramezani, M., Akan, T., Asgari-Chenaghlu, M., Nikzad-Khasmakhi, N., & Balafar, M. A. (2023). A model to measure the spread power of

rumors. *Journal of Ambient Intelligence and Humanized Computing*, 14(10), 13787-13811.

Kelly, S. R. (2004). *Rumors in Iraq: A guide to winning hearts and minds*. Unpublished Master's Thesis. Naval Postgraduate School Monterey Ca Dept of National Security Affairs.

Knapp, R.H. (1944). A psychology of rumor. *Public opinion quarterly*, 8(1), 22-37.

Manaf, M. M. A., Ghani, E. K., &Jais, I. R. M. (2013). Factors influencing the conception of rumors in workplace. *Journal of art and humanities,* 2(6), 50-63.

Marett, K., & Joshi, K. D. (2009). The decision to share information and rumors: Examining the role of motivation in an online discussion forum. *Communications of the Association for Information Systems*, 24(1), 47-68.

Mendoza, M., Poblete, B., & Castillo, C. (2010). Twitter under crisis: Can we trust what we RT?SOMA '10: *Proceedings of the First Workshop on Social Media Analytic*s, USA. pp. 71-79.

Nkpa, N. K. (1975). Rumor mongering in war time. *The Journal of Social Psychology*, 96(1), 27-35.

Oh, O., Kwon, K. H., & Rao, H. R. (2010). An Exploration of Social Media in Extreme Events: Rumor Theory and Twitter during the Haiti Earthquake 2010. *Icis 2010 Proceedings*, USA, 231, 7332-7336.

Osetrova, E.V. (2013). Rumors as a Subject of Scientific Analysis: Social Psychology, History, Philology. *Journal of Siberian Fereral University. Humanities & Social Sciences*, 6(9), 1265-1279.

Oyewo, O. O. (2009). Rumor: An alternative means of communication in a developing nation: The Nigerian example. *International Journal of African & African-American Studies*, 6(1), 22-35.

Palen, L., Vieweg, S., Liu, S. B., & Hughes, A. L. (2009). Crisis in a networked world: Features of computer-mediated communication in the April 16, 2007, Virginia Tech event. *Social Science Computer Review*, 27(4), 467-480.

Prasad, J. (1950). A comparative study of rumors and reports in earthquakes. *British Journal of Psychology. General Section*, 41(3-4), 129-144.

Rosnow, R. L. (1988). Rumor as communication: A contextualist approach. *Journal of Communication*, *38*(1), 12-28.

Rosnow, R. L., & Foster, E. K. (2005). Rumor and gossip research. *Psychological Science Agenda*, 19(4), 1-2.

Shibutani, T. (1967). Improvised news: A sociological study of rumor. *Social Forces,* 46 (2). 298-299.

Simon, T., Goldberg, A., Leykin, D., &Adini, B. (2016). Kidnapping WhatsApp–rumors during the search and rescue operation of three kidnapped youth. *Computers in human behavior*, *64*, 183-190.

Starbird, K., Maddock, J., Orand, M., Achterman, P., & Mason, R. M. (2014). Rumors, false flags, and digital vigilantes: Misinformation on twitter after the 2013 Boston marathon bombing. *I Conference 2014 Proceedings*, USA, 1-10.

Tajfel, H. (1982). Social psychology of intergroup relations. *Annual review of psychology*, 33, 1-39.

Xia, Z., & Huang, L. (2007). Emergence of social rumor: Modeling, analysis, and simulations. *International Conference on Computational Science,* Springer, Berlin, Heidelberg, 90-97.