Iranian Journal of Educational Sociology

# Iranian journal of educational Sociology

http://www.injoeas.com/
**(Interdisciplinary Journal of Education)**
**Available online at: http://www.iase-idje.ir/**
*Volume 5, Number 2, September 2022*

# Normalization (Standardization) of Rumors Acceptance Questionnaire among Audience of Social Networking Apps

Amir Abbas Taghipour[1], Mahmood Reza Mohammad Taheri[2*], Mohammad Soltanifar[3]

1. PhD Student, Department of Communication, UAE Branch, Islamic Azad University, Dubai, UAE.
2. Assistant Professor Assistant Professor, Department of Social Communication, Central Tehran Branch, Islamic Azad University, Tehran, Iran.
3. Associate Professor Associate Professor, Department of Media Management, Science and Research Branch, Islamic Azad University, Tehran, Iran.

**Article history:**
Received date: 2021/10/31
Review date: 2021/11/20
Accepted date: 2021/12/01

**Keywords:**
Normalization, Acceptance of Rumors, Social Networking Apps.

**Purpose**: Today, using social networking apps has developed a lot. For this reason, the present study was conducted to normalize rumors acceptance questionnaire among the audience of social networking apps.
**Methodology**: The present study was applied in terms of objective and descriptive correlational in terms of correlation type. The research population consisted of active Iranian audiences in Telegram and Instagram during 2019-2020. The sample size was estimated to be n=368, who were selected using the convenience sampling method, respecting the proportion of users of Telegram and Instagram. The data were collected by rumors acceptance questionnaire (Kim & Bock, 2011) and analyzed by confirmatory factor analysis (CFA) and one-sample t-test using SPSS.
**Findings**: The results showed that the rumor acceptance questionnaire had 48 items and five factors of rumor transmission, reasoning, negative emotions, credibility and believing, and the factor loading of all items and their factors were above 0.40. In addition to confirming the construct validity of the tool by the factor analysis, the content validity of the tool according to the opinion of experts and reliability by Cronbach's alpha for the five factors were 0.91, 0.87, 0.83, 0.88 and 0.92; and 0.95 for the tool, respectively. Other results showed that the average acceptance of rumors and its factors were higher than the average except for rumor transmission, which was lower than the average ($P<0.05$).
**Conclusion**: The rumors acceptance questionnaire among the audience of social networking apps had good validity and reliability. Therefore, the above tool can be used by other researchers to check the acceptance of rumors.

**Please cite this article as:** Taghipour AA, Mohammad Taheri MR, Soltanifar M. (2022). Normalization (Standardization) of Rumors Acceptance Questionnaire among Audience of Social Networking Apps, **Iranian Journal of Educational Sociology.** 5(2): 156-165.

* Corresponding Author Email: mtpeace2004@yahoo.com

## 1. Introduction

Today, there are thousands of social networking apps on the Internet, each of which was launched based on a specific topic, and the objective of social network services is to build online communities of people who want to share their interests and activities and learn about the interests and activities of others. Social networking apps are new platforms that have become the focus of users' attention, and each one brings together a group of users with specific characteristics (Shams & Forghani, 2019). Social networking apps facilitate the rapid and wide spread of information and create suitable settings for broadcasting content to attract new audiences, and since rumors are more attractive and available to the public, they can spread faster and more widely than reality (Shahamatinejad, 2021). Rumor is a possible social phenomenon, and although it is a negative phenomenon and has been criticized, many people are interested in following up on rumors (Yao, Gu, Gu & Huang, 2022). Rumor in Dehkhoda dictionary means baseless news among people, and a current narrative or report among people within the range of known authority without reliable evidence to confirm its truth in Webster dictionary. In another definition, rumor means a statement that is published without official proof by the relevant authorities (Moghimi & Ghafari, 2016). Rumors are speculations that are used to fill gaps and / or eliminate contradictions in existing knowledge and are usually spread from one person to another in face-to-face interactions (Liu, Wu, Yang, Zhu & Zhong, 2019). Rumor is an informal discussion about a person or organization that occurs in a social setting and is difficult to control and can have adverse effects (Ni, Guo, Huang & Wu, 2020). Rumor as a social phenomenon has different types. Fear rumor is made and spread to create fear, worry and terror in the society. Pessimism rumor is made to promote pessimism and harassment towards popular and powerful people or groups in the society. Division rumor is made for creating and increasing divisions and differences between a commander and a soldier, spouses, two tribes, and generally between two people or groups. Deceit rumor is like a smoke screen to hide the real goals of the enemy. Economic rumor is to create concern, anxiety and fear in the national market and the economic status of the country, especially during wars and crises (Azarshin & TajikEsmaeili, 2018).

Rumor transmission is a negative behavior in the public mind. However, it is a favorite action and activity of many people in society (Yu, Lu, Wang & Li, 2021). There are various motives, including showing off (attempting to attract the attention of others to increase one's credibility), reassurance and emotional support (attempting to use emotional support or sympathy rather than denial), projection (attempting to projecting fears, desires and characteristics that he probably is not aware of in himself), aggression (attempting to hurt, slander and endanger others) and offering pleasant things (attempting to flatter the listener or tell good news) (Rivero, 2013). Rumors usually have complex objectives and are considered as a way to discharge emotions. In other words, while they justify a person's feeling and emotion to a specific situation, they finally act as an emotional discharge in uncertainty (Bodaghi & Oliveira, 2020). This phenomenon is one of the social realities in any society that to some extent directs, excites, or leads to stagnation and harmony in public opinion, although it does not confirm the facts, and since it is related to an important issue that research about right or wrong is difficult, it is very effective. In addition, in some cases, rumors are so powerful that can be compared to the driving force or destructive force of society (Torkaman & Shahabi, 2016). Rumors usually have three distinct aspects. First, they are spread from one person to another through informal communication by words and from one to other. Second, the source of the rumor cannot be determined simply and easily. Third, once it becomes widespread, it is no longer possible to simply stop its spread and, so to speak, control or manage it (Yu, Yu, Jiang Yang, 2021).

In order to accept rumors, there should be two conditions: 1) the topic of the rumor is important for the speaker and the listener, and 2) the real events are shrouded in some kind of uncertainty. This uncertainty can be induced by the lack of accurate news or by some emotional tension that forces a person to be unable or unwilling to accept the facts presented in the news (Torkaman & Shahabi, 2016). Social networking apps play an effective role in accepting rumors and not only make many users of these networks accept their news, but also spread rumors to other users. For example, we can mention the types of rumors that are released in

social networking apps about the private life of politicians, artists and famous athletes of the country and become so widespread and believable that even the mass media are affected (Shams & Forghani, 2019).

Although there have been studies about rumors and rumor-spreading in Iran, no study was found about norm-setting or making tools in this field, and the results of the most important national studies about rumors and international studies about making tools related to rumors are reported below.

Gandi (2019) in a study entitled "Scale of Rumor Transmission" provided a tool with 50 items and seven factors of rumor identification, rumor transmission, effect of rumor, attitude to response, role of rumor belief, type of rumor and rumor management on 570 people, which construct validity was confirmed by factor analysis and its total reliability was obtained 0.78 from Cronbach's alpha.

Abidin and Han (2018) in a study entitled "Rumor Scale for Educational Institutions" provided a 24-item tool with the three factors of information acquisition, socialization and pessimistic effect on 322 teachers working in 25 elementary schools, and the results indicated appropriate validity and reliability.

Babaei Aghbolagh and Sattari Ardabili (2018) in a study concluded that seven factors affecting organizational rumor included confidential issues, lack of organizational affiliation, professional competence, social information, political affairs, financial affairs and individual characteristics, for which a tool called an organizational rumor scale was designed. The validity of all factors was confirmed by factor analysis and the reliability of all factors was higher than 0.70 by Cronbach's alpha.

Torkaman and Shahabi (2016) introduced the social factors affecting the acceptance of rumors, including situational effects (with two components of status effects and readiness effects), communication effects (with one component of communication tools) and perspective effects (with one component of rumor transmission).

Sudhir and Unnithan (2014) in a study entitled "Measurement of Audience's Motivations for Sharing Rumor" provided a 21-item tool with four factors of anxiety management motivation, information sharing motivation, relationship management motivation, and self-enhancement motivation, which had acceptable validity and reliability.

Nevo, Nevo and Derech-Zehavi (1993) in a study entitled "Development of Tendency to Gossip Questionnaire: Simultaneous Provision and Validation" for a sample of Israeli students provided a 20-item questionnaire on 120 students (58 women and 62 men) and concluded that the questionnaire had four factors of physical appearance, success, social information and harmful gossip, whose validity and reliability were confirmed.

Spreading rumors and accepting rumors is a social and psychological problem with wide dimensions that can have many negative consequences for a person, group or society. When there is a normalized tool for rumors or acceptance of rumors, it is possible to measure the amount and relationship with other variables and plan to reduce and adjust rumors. Research by researchers indicated that although there are tools about rumors from different aspects abroad, no tool has been normalized or developed inside the country. Given the above gap, the researchers in the present study attempted to normalize a tool for accepting rumors, which is one of the relatively new and comprehensive tools that have been used in several national studies, Kim & Bock (2011) rumors acceptance questionnaire. As a result, due to the ever-increasing expansion of the audience of social networking apps and the increase in rumors, the present study was conducted to normalize rumors acceptance questionnaire among the audience of social networking apps.

## 2. Methodology

The present study was applied in terms of objective and descriptive and correlation in terms of method. The research population consisted of active Iranian audiences in Telegram and Instagram during 2019-2020. The sample size was estimated to be n=368, who were selected using the convenience sampling method, respecting the proportion of users of Telegram and Instagram. The reason for using the mentioned two networks was the high usage and large number of users of these two networks compared to other social networking apps. In the convenience sampling method, first, the statistics estimated users of two networks,

according to the annual report of We are social, at the beginning of 2018, the number of active Iranian users on Instagram to be 24 million people. Since in the early days of 2019, the information of 42 million Iranian users of Telegram was disclosed, after it was filtered, the number of Telegram users reduced significantly and the number of Instagram users increased. For this reason, a 50% share was included for each of Telegram and Instagram. Then, among the activists of the mentioned two social networking apps, 368 people were selected (184 people in each network) to whom the researcher had access as a sample.

To conduct this study, Kim and Bock (2011) rumors acceptance questionnaire was first translated. It should be noted that in a preliminary study, the questionnaire was on 30 users of Instagram and Telegram, and the total reliability was obtained 0.81 using the Cronbach's alpha. Next, the statistics of active users of each of Instagram and Telegram were estimated and the researcher selected the samples. Then, the researcher explained the importance and necessity of research virtually and introduced himself to the users as a person committed to complying with ethical considerations. Finally, the said questionnaire was sent to them in addition to the demographic information form and they were asked to complete and send it after three days. It should be noted that they were asked to answer all the items and questions completely and honestly. In addition, after the set period for completing the tools (three days), a follow-up was done for three times at a three-day interval so that all people respond to the research tools that are introduced below.

The first tool of the present study was the demographic information form. This form had questions including education, age, gender and marital status. The second tool of the present study was Kim & Bock (2011) rumors acceptance questionnaire with 48 items. So that the items were scored based on the seven-point Likert scale from one (completely disagree) to seven (completely agree) and the tool score was calculated with the total score of the items. So, the range of total scores of the tool is between 48 and 336 and a higher score indicates a higher rumors acceptance. The questionnaire can be implemented both individually and in groups. Kim & Bock (2011) confirmed the construct validity of the tool by exploratory factor analysis (EFA) and the results showed a suitable factor loading for each factor, and the reliability of the tool and each factor by Cronbach's alpha higher than 0.70. It should be noted that in the present study, the content validity of rumors acceptance questionnaire was confirmed after translation by 15 experts who were among the faculty members of the communication department.

The descriptive data were analyzed by frequency and percentage of frequency, and inferential data were analyzed by confirmatory factor analysis (CFA) and one-sample t-test using SPSS.

## 3. Findings

The results of descriptive analyzes including the frequency and frequency percentage of demographic information of the audience of Instagram and Telegram are presented in Table 1.

**Table 1.** Results of descriptive analyzes including the frequency and frequency percentage of demographic information of the audience of Instagram and Telegram

| variable | level | F | % |
|---|---|---|---|
| education | Diploma and below | 83 | 22.55 |
| | Associate degree | 71 | 19.29 |
| | B.A | 111 | 30.16 |
| | M.A | 81 | 22.01 |
| | Ph.D. | 22 | 5.98 |
| age | below 21 years | 53 | 14.40 |
| | 21-30 years | 151 | 41.03 |
| | 31-40 years | 91 | 24.73 |
| | 41-50 years | 47 | 12.77 |

| | | | |
|---|---|---|---|
| | above 50 years | 26 | 7.07 |
| gender | male | 138 | 37.50 |
| | female | 230 | 62.50 |
| marital status | single | 196 | 53.26 |
| | married | 172 | 46.74m |

In the present study, the study results of descriptive data showed that most of the active users of Instagram and Telegram had a bachelor's degree (30.16%), and were 21-30 years (41.03%), female (62.50%) and single (53.26%) (Table 1).

Before inferential analysis, the assumptions of the analysis method were first examined, and based on the results of the Kolmogorov-Smirnov test, with a value of 6.39 at a significance level of 0.69, the assumption of normality was not rejected. Also, the results of Kaiser-Meyer-Olkin (KMO) Measure with a value of 0.63 and Bartlett's sphericity test with a value of 879.90 were significant at the level of 0.001, indicating sufficient correlation and sample adequacy. The results of the factor analysis by varimax rotation of rumors acceptance questionnaire on the audience of Instagram and Telegram are presented in Table 2.

**Table 2.** Results of factor analysis by Varimax rotation of rumors acceptance questionnaire among the audience of Instagram and Telegram

| No. | the first factor rumor transmission | the second factor reasoning | the third factor negative emotions | the fourth factor credibility | the fifth factor believing |
|---|---|---|---|---|---|
| 1 | 0.764 | | | | |
| 2 | 0.714 | | | | |
| 3 | 0.855 | | | | |
| 4 | 0.736 | | | | |
| 5 | 0.457 | | | | |
| 6 | 0.680 | | | | |
| 7 | 0.467 | | | | |
| 8 | 0.834 | | | | |
| 9 | 0.629 | | | | |
| 10 | 0.474 | | | | |
| 11 | 0.558 | | | | |
| 12 | 0.762 | | | | |
| 13 | 0.723 | | | | |
| 14 | 0.621 | | | | |
| 15 | 0.780 | | | | |
| 16 | 0.745 | | | | |
| 17 | 0.534 | | | | |
| 18 | 0.864 | | | | |
| 19 | 0.832 | | | | |
| 20 | 0.711 | | | | |
| 21 | 0.750 | | | | |

| | | | | | |
|---|---|---|---|---|---|
| 22 | 0.523 | | | | |
| 23 | 0.634 | | | | |
| 24 | 0.646 | | | | |
| 25 | 0.755 | | | | |
| 26 | | 0.912 | | | |
| 27 | | 0.622 | | | |
| 28 | | 0.741 | | | |
| 29 | | 0.646 | | | |
| 30 | | 0.641 | | | |
| 31 | | 0.559 | | | |
| 32 | | 0.644 | | | |
| 33 | | | 0.714 | | |
| 34 | | | 0.823 | | |
| 35 | | | 0.745 | | |
| 36 | | | 0.702 | | |
| 37 | | | | 0.621 | |
| 38 | | | | 0.780 | |
| 39 | | | | 0.562 | |
| 40 | | | | | 0.756 |
| 41 | | | | | 0.655 |
| 42 | | | | | 0.762 |
| 43 | | | | | 0.641 |
| 44 | | | | | 0.735 |
| 45 | | | | | 0.527 |
| 46 | | | | | 0.614 |
| 47 | | | | | 0.607 |
| 48 | | | | | 0.733 |

In the present study, the results of factor analysis by Varimax rotation for rumors acceptance questionnaire on the audience of Instagram and Telegram showed that the questionnaire had 5 factors and the factor loading of all their items was higher than 0.40. So that the first factor rumor transmission had 25 items, the second factor reasoning had 7 items, the third factor negative emotions had 4 items, the fourth factor credibility had 3 items and the fifth factor believing had 9 items (Table 2).

The results of factor analysis to determine the factor loading of each factor, content validity ratio (CVI), average variance extracted (AVE) and reliability by Cronbach's alpha for rumors acceptance questionnaire on the audience of Instagram and Telegram are presented in Table 3.

**Table 3.** Results of factor analysis to determine the factor loading of each factor, CVI, AVE and reliability with Cronbach's alpha for the rumor acceptance questionnaire among the audience of Instagram and Telegram

| factors | Number of Items | Factor Loading | CVR | AVE | Reliability Cronbach's alpha |
|---|---|---|---|---|---|
| rumor transmission | 25 | 0.75 | 0.81 | 0.64 | 0.91 |
| reasoning | 7 | 0.67 | 0.83 | 0.57 | 0.87 |
| negative emotions | 4 | 0.71 | 0.57 | 0.48 | 0.83 |
| credibility | 3 | 0.53 | 0.64 | 0.53 | 0.88 |
| believing | 9 | 0.64 | 0.72 | 0.59 | 0.92 |
| rumors acceptance | 48 | ----- | ----- | ----- | 0.95 |

In the present study, the results of factor analysis for rumors acceptance questionnaire among the audience of Instagram and Telegram showed that the factor loading of all 5 factors is higher than 0.40, CVI of all 5 factors is higher than 0.60, AVE of 5 factors in the range of 0.48-0.64. The reliability by Cronbach's alpha for all 5 factors and the tool was higher than 0.70 (Table 3).

The results of a sample t-test to determine the acceptance of rumors and its factors among the audience of Instagram and Telegram are presented in Table 4.

**Table 4.** Results of one-sample t-test test to determine the acceptance of rumors and its factors in the audience of Instagram and Telegram

| variable | M | SD | mean theoretical difference | t-statistic | significance |
|---|---|---|---|---|---|
| rumor transmission | 2.21 | 0.70 | -0.79 | 6.62 | 0.001 |
| reasoning | 3.37 | 0.78 | 0.37 | 6.85 | 0.001 |
| negative emotions | 3.09 | 0.66 | 0.09 | 3.09 | 0.040 |
| credibility | 3.68 | 0.89 | 0.68 | 8.16 | 0.001 |
| believing | 3.23 | 0.72 | 0.23 | 6.13 | 0.009 |
| rumors acceptance | 3.11 | 0.69 | 0.11 | 5.26 | 0.037 |

In the present study, the results of one-sample t-test to determine the acceptance of rumors and its factors among the audience of Instagram and Telegram showed that the average acceptance of rumors and its factors were above average, except for rumor transmission, which was lower than average ($P<0.05$) (Table 4).

## 4. Discussion

Given the development of social networking apps and audience, and the lack of a tool to measure the acceptance of rumors, the present study was conducted to normalize the questionnaire of acceptance of rumors among the audience of social networking apps.

The results of the present study showed that rumors acceptance questionnaire had 48 items and five factors of rumor transmission, reasoning, negative emotions, credibility and believing , whose validity and reliability were confirmed and rumor acceptance and its factors other than rumor transmission, which was below average, were above average. In some ways, the results are similar to the study results of Gandi (2019) on the 50-item rumor transmission scale with seven factors of rumor identification, rumor transmission, effect

of rumor, attitude towards response, role of rumor belief, type of rumor and rumor management, Abidin and Han (2018) ) on rumor scale for organizational institutions with 24 items and three factors of information acquisition, socialization and pessimistic effect, Babaei Aghbolagh and Sattari Ardabili (2018) on seven factors affecting organizational rumors including confidential issues, lack of organizational affiliation, professional competence, social information, political affairs, financial affairs and personal characteristics, Torkaman & Shahabi (2016) on the factors of situational effects (with two components of status effects and readiness effects), communication effects (with one component of communication tools) and perspective effects (with one component of rumor generation) as social factors affecting the acceptance of rumors, Sudhir and Unnithan (2014) on a scale for measuring audience motivations for sharing rumors with 21 items and four factors of anxiety management motivation, information sharing motivation, relationship management motivation and self-enhancement motivation and Nevo et al. (1993) on the development of tendency to gossip questionnaire with 20 items and four factors of physical appearance, success, social information and harmful gossip.

For explaining the results of the present study, it can be said that as a social activist, human is always willing to talk about common issues, follow up on various issues, and spread information to others, which is sometimes based on awareness or ignorance, personal taste, group benefit, etc. In this regard, the phenomenon of rumors and rumors acceptance is a common epidemic in all societies, the severity of which depends on the impact indicators such as media literacy, the power of the media, social capital, public culture, cultural lag, the power of social networking apps, the level of community literacy, acceptability and responsibility of the mass media, the level of rationality, critical conditions, beliefs, conflict of interests, political knowledge, immorality and non-adherence to religious issues, institutional trust and the level of community stability. From a sociological perspective, it was found that the rumor as a social phenomenon is affected by various factors, each of which in some way shows the cultural, social and political characteristics of a country. The rumor and its acceptance is the result of the economic, political, social and cultural situation of the people who live in a country, but unfortunately, most of the social networking apps with regard to advertising purposes and attracting more audiences always cause the promotion of false news and the formation of a bubble of awareness, especially among the teenagers and youth. Promoting false narratives of history, encouraging consumerism and prescribing lethal drugs such as slimming pills, obesity, height increase, etc., spreading false news related to divorce or the death of important people all raise as an epidemic in the absence of media literacy.

Also, for explaining the higher than average acceptance of rumors and its four factors including reasoning, negative emotions, credibility and believing and lower than average rumor transmission in the audience of Instagram and Telegram, it can be said that most of the subjects of the present study had bachelor's degree, and were young (21-30 years old), female and single. Since there is no special and attractive hobby, so they tend to entertain themselves in some way, which is one of the interesting and attractive tools. For entertainment, they use Instagram and Telegram, which makes them spend a lot of time searching in the said networks and follow their news and accept them as facts. As a result, this causes them to be at a higher than average level in terms of components or factors such as reasoning, negative emotions, credibility, and believing , but they themselves have less desire to spread news and rumors and therefore rumor transmission is lower than average.

The tools of the present study were completed virtually, which made it impossible to control the subjects while completing the tools. It is possible that people did not have enough self-reflection and did not answer the items responsibly. Of course, completing the tools through virtual networks can be considered a strength if they are completed after a detailed study of the items. Because the use of this method reduces the cost of commuting and copy, and in addition, it causes the subjects to respond to the tools at their desired time when they are not busy and during the desired period of time and with more accuracy. Another limitation is the research population limited to the audience of Instagram and Telegram and the relatively small sample size for the construction or standardization of a tool. Therefore, increasing the sample size to normalize the tool can increase the accuracy of the results. It is suggested to the future researchers to normalize rumors

acceptance questionnaire on the audience of WhatsApp. It seems that acceptance of rumors is different in married and single people, with different education levels, genders (male and female), employment status (employed and unemployed), etc. For this reason, it is suggested to future researchers to investigate the acceptance of rumors and their factors or components in the mentioned groups and compare them with each other.

The rumors acceptance questionnaire with five factors of rumor transmission, reasoning, negative emotions, credibility and believing had good validity and reliability. Therefore, this tool can be used as a suitable tool by future researchers. Also, experts and planning officials for specific groups, including teenagers and youth, can use this tool to measure the acceptance of rumors and then plan to reduce it through its components or factors by media literacy, evaluating the credibility of sources, strengthening the reasoning. etc. in order to reduce the acceptance of rumors by the audience and prevent the spread of rumors. Also, the existence of this tool can provide researchers and even different organizations with new ways to expand more research in the field of acceptance of rumors, especially among teenagers and youth.

***Acknowledgments***

Hereby, we acknowledge the participants in this study for their good will and cooperation in completing the tools.

**References**

Abidin D, Han B. (2018). Organizational rumor scale for educational institutions. *Universal Journal of Educational Research*. 6(5): 936-946.

Azarshin SA, TajikEsmaeili S. (2018). An investigation into the believability of the phenomenon of rumor in mobile messenger in city of Ahvaz with regard to the role of national media. *Culture-Communication Studies*. 18(40): 65-94. [Persian]

Babaei Aghbolagh M. Sattari Ardabili F. (2018). Investigating the constructs of psychosocial and organizational gossip behavior. *Journal of Psychological Science*. 17(69): 545-556. [Persian]

Bodaghi A, Oliveira J. (2020). The characteristics of rumor spreaders on Twitter: A quantitative analysis on real data. *Computer Communications*. 160: 674-687.

Gandi JC. (2019). Rumor scale development. *Quantitative Psychology*. 429-447.

Kim JH, Bock GW. (2011). A study on the factors affecting the behavior of spreading online rumors: Focusing on the rumor recipient's emotions. Australia: *Pacific Asia Conference on Information Systems*. 7-11.

Liu W, Wu X, Yang W, Zhu X, Zhong S. (2019). Modeling cyber rumor spreading over mobile social networks: A compartment approach. *Applied Mathematics and Computation*. 343: 214-229.

Moghimi SM, Ghafari R. (2016). Managers‘ obligation to ethics and rumors management in public organizations. *Organizational Culture Management*. 14(1): 1-26. [Persian]

Nevo O, Nevo B, Derech-Zehavi A. (1993). The development of the tendency to gossip questionnaire: Construct and concurrent validation for a sample of Israeli college students. *Educational and Psychological Measurement*. 53(4): 973-981.

Ni Q, Guo J, Huang C, Wu W. (2020). Community-based rumor blocking maximization in social networks: Algorithms and analysis. *Theoretical Computer Science*. 840: 257-269.

Rivero O. (2013). Rumors in the workplace affecting organizational change readiness. *Global Journal of Management and Business Research Administration and Management*. 13(12): 50-53.

Saffarinia M, Mazidi AM, Saffarinia M. (2016). A comparison between spreading internet rumors and narcissism among face book, internet, and non-internet users. *Social Cognition*. 5(1): 68-82. [Persian]

Shahamatinejad S. (2021). The relationship between health anxiety and emotion regulation with rumors on social networks during the COVID-19 pandemic. *Journal of Assessment and Research in Counseling and Psychology*. 3(1): 38-48. [Persian]

Shams M, Forghani M. (2019). The role of social networks in generating rumors in election periods (Case study: Instagram). *Quarterly Scientific Journal of Audio-Visual Media*. 12(28): 95-120. [Persian]

Sudhir S, Unnithan AB. (2014). Measuring consumer motivations to share rumors: Scale development. *International Journal of Online Marketing*. 4(3): 51-67.

Torkaman F, Shahabi Z. (2016). Rumor and the effective social factors on rumor adoption. *The Socio-Cultural Research Journal of Rahbord*. 5(2): 191-215. [Persian]

Yao X, Gu Y, Gu C, Huang H. (2022). Fast controlling of rumors with limited cost in social networks. *Computer Communications*. 182: 41-51.

Yu S, Yu Z, Jiang H, Yang S. (2021). The dynamics and control of 2I2SR rumor spreading models in multilingual online social networks. *Information Sciences*. 581: 18-41.

Yu Z, Lu S, Wang D, Li Z. (2021). Modeling and analysis of rumor propagation in social networks. *Information Sciences*. 580: 857-873.