Research Paper

Effectiveness of Narrative and Emoji in Covid-19 Vaccine Awareness Text-Messages for Adult Population of Chandigarh, India

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Abstract
This study was undertaken with the objective of understanding the effectiveness of various kinds of formats for the same text message in the context of health messages in relation to the COVID-19 vaccine. The investigators created a message about the vaccine and the follow up care after getting vaccinated. The message was supplemented with narrative and emoji interventions. Four groups- one control group and three experimental groups were formed for the study. These four groups were each presented with the following formats of messages:

- *Control group-CG- Non narrative form without emojis*
- *Experimental group-1- EG1-Non-narrative, with emojis*
- *Experimental group-2- EG2-Narrative without emojis*
- *Experimental group-3- EG3-Narrative with emojis*

The total sample considered for this study comprised 122 individuals in the age group of 18 to 25. The sample was collected randomly. The same was also randomly distributed among the four groups. The data was collected online with the aid of 4 different Google forms, which consisted of the same questions, but with a different format of the message on top. The analysis shows that the inclusion of narrative elements in COVID-19-vaccine related awareness messages increases the transportation as well as elaboration felt amongst participants. The presence of emojis had a negative impact on elaboration levels. Statistical results derived from analyzing the main effect of Gender in terms of mean scores of different variables also reaffirmed previous literature surrounding differences between males and females in areas of transportation and counter arguing. Females are better at transportation and males are better at counter arguing.

I.   Introduction

When the COVID pandemic began, it isolated us to our homes and altered the social fabric, but technology kept us connected throughout. Every aspect of our lives became digital. Schools started teaching online, people started working from home, and text messages and video calls enabled us to communicate with everyone. In this unprecedented crisis, it was important that the communication lines would run smoothly. Text messaging is a crucial and popular form of communication.

Considering the importance of the text form of communication, awareness about safety protocols, precautions, vaccines, and other issues could be spread with text messaging since it is a very effective form of communication. The concept of 'm-health'i.e. spreading health information via mobile phones, has been growing and was used to spread awareness about various health issues even before the pandemic began. 'Presenting health information in a manner that is clear and comprehensible is crucial for effective health promotion initiatives. As such, health literacy, the ability to understand basic health information, is a key consideration given that people with low health literacy have worse health outcomes in comparison to those with high health literacy (Berkman et al., 2011, Perrier and Martin Ginis, 2016).'

Overall, it was understood that the use of text messaging to spread health awareness was an important tool, but the next question was: how will these messages be designed to be the most effective and to have the maximum impact on the receiver? Is the reader able to understand the text? Is the language of the text too complicated? Is the text able to keep the attention of the reader till the end? Does the reader question the credibility of the text? Is the user internally trying to counter-argument the information in the text? Do readers understand narrative texts better than non narrative ones? Does adding emojis improve the understanding of the text or does it diminish the credibility of the source? Many more such related questions related to the reader's perception of a health text arise.

It is imperative that all of these questions are answered and all factors related to the perception of the texts are considered so that the most effective text can be designed to spread information to the masses by utilising 'm-Health'.

As the vaccination drive continues, it is important to spread the related information to the general population so that everyone can be vaccinated against the COVID- 19 virus. Text messaging can be a great tool to accomplish this goal, but for these messages to be effective, they must be easy to understand, credible, able to retain the attention of the reader, and able to mitigate the chance of counter argument.

Present study

The present study focuses on the effectiveness and impact of various characteristics of a health text message, that is, transportation, credibility, elaboration, and counter argument. The investigators created a message about the vaccine and the follow up care after getting vaccinated. Four groups, one control and three experimental groups, were formed for the study. These groups were presented the following formats of messages: control group- non narrative form without emojis, experimental group 1- non narrative with emojis, experimental group 2- narrative without emojis, and experimental group 3- narrative with emojis. The data collected was analysed in terms of the characteristics of the message, that is, transportation credibility, elaboration, and counter argument. The main effects of format and gender were studied independently, and then their interaction was studied. The study is significant because understanding which format is most effective in communicating health messages can enable organisations at local and national level to spread the associated information in an impactful manner.

Keywords
Narrative, emoji, COVID-19, text messaging, transportation, credibility, elaboration, counter argument, vaccine awareness

II.   Review of related literature

Emojis

The lack of non-verbal cues in computer-mediated communication is the primary reason for the development of emoticon software in electronics used for text-based communication. Emoticons, or Emojis, are graphical representations that convey moods, emotions, and thoughts, their resemblance with real objects (Riordan, 2017). Their usage is highly prevalent among young people who use emojis for text-messaging in various situations ((McFarland, 2013). Although a substantial adult and elderly population also utilise emojis for communication, there are noticeable age-related differences when it comes to the interpretation of certain emoticons (Jaeger *et al,* 2017).

There has been considerable research regarding the use of emoticons to express the sender's emotions (Walther & D'Addario, 2001), and affect the interpretation of information (Derks, Bos, & Von Grumbkow, 2008). Emojis have been shown to be instrumental in utilisation during interpersonal communications when the readers have a low need for cognition and are engaging in peripheral, low-effort processing. (Duan, Xia, & SwolLyn, 2018)

Narratives in mobile interventions

Although narratives are proven to be effective at eliciting emotions and convincing audience members, little research has been done on their effectiveness in text-based messaging through electronic devices such as phones and computers, specifically in the context of messages promoting certain habits and behaviours conducive to health. The usage of personal mobile devices has greatly increased in recent years, so it has become important to study the impact of narration through this intervention. Narratives or stories generally have been a promising method of encouraging positive health actions among young people in non-electronic settings (Banerjee & Greene, 2013). One particular example of the successful use of narration to promote health through text-messages comes out of Mozambique, where more than 70% of participants felt that the health-issues addressed in the stories were very clear and impacted their knowledge (Feyisetan, Benevides, Jacinto & Mutombo, 2015).

Transportation

Transportation is conceptualized in academia as a convergent process, where all metal systems, attention, imagery, and feelings become focused on events occurring in the narrative. In other words, the reader is immersed in the story. The reader loses access to some real-world facts in favour of following the narrative world. He/ She may also be less aware of some of those facts which contradict assertions made in the narrative. (Green & Brock,2000). Thus, narratives that transport individuals to a greater degree can reduce counterarguments (Slater & Rouner, 2002) and aid the process of encouraging different behaviours through text-messaging. In the field of health-awareness, greater transportation resulted in higher anti-cocaine expectancies in college students' responses to anti-drug campaigns curated by the researchers (Banerjee & Greene, 2012).

Elaboration

It is irrational for people to scrutinize every message they receive daily, as one has a limited amount of information processing time and capacity. People therefore choose the messages to scrutinise by their relevance and think carefully about the issue-relevant information. (Petty & Cacioppo,1986). Different information is processed differently. If the reader is motivated by the subject, he/she is more likely to process it centrally, which involves analysing the logical arguments and making informed decisions, (Willoughby & Liu, 2018). For example, if the reader has a family history of diseases, the reader might be motivated to carefully anaylse texts involving healthy lifestyle choices.

When the individual is not motivated to process the message, he/she tends to process information peripherally (Petty & Cacioppo, 1981). This involves dependency on cues such as a presence of an attractive source or a recognised sponsor. In a digital environment where young people choose to limit the mental effort they put into processing information, the attractiveness and relevance of the messages themselves might result in success in the context of health awareness messages.

Credibility

Perception of Credibility plays a discernible role in determining a reader's attitudes and behavioural intentions towards messages. (Hu & Shyam Sundar,2010). Credibility cannot be attributed solely to the source; other factors such as medium of delivery and message structure play a role, (Metzger, Flanagin, Eyal, Lemus, & Mccann, 2003). Substantial research has been done to create relevant scales to measure a reader's perception of message-credibility. Appelman & Sundar (2016) ask participants to indicate, using a Likert Scale, how well certain adjectives represent the article they have read. The developed scale is found to be reliable and valid, as well as theory-driven.

Experimental Test of Narrative and Emojis in Text-message Intervention

The data from Willoughby & Liu's (2018) 3x2 experiment setup designed to test the effectiveness of narratives and emojis in health awareness text-messages was studied to gain insight and served as a precursor to our research. The responses of participants to questionnaires related to the different messages being shown were analysed to compare certain variables, including transportation and elaboration. The results consisted of mixed findings of significant and insignificant differences between the 3 groups of emoji levels (high, low, and none) and the 2 groups of narrative intervention (narrative vs non-narrative). One significant finding was that the non-narrative messages with zero emoji level increased message-credibility and elaboration.

Objectives:

1.   To study the main effects of different types of text-messaging styles (non narrative without emojis, non narrative with emojis, narrative without emojis, and narrative with emojis), in terms of credibility, transportation, elaboration, and counter-argument.
2.   To study the main effects of gender in terms of credibility, transportation, elaboration, and counter-argument.
3.   To study the interaction effects between different text-messaging styles and gender.

Hypotheses

Credibility

1.   There is no significant difference between different messaging groups in terms of mean scores for credibility of the message.
2.   There is no significant difference between males and females in terms of mean scores for credibility of the message.
3.   There is no significant interaction between different messaging groups and gender in terms of mean scores for credibility of the message.

Transportation

4.   There is no significant difference between different messaging groups in terms of mean scores on transportation of the message.

5.   There is no significant difference between males and females in terms of mean scores on transportation of the message.

6.   There is no significant interaction between different messaging groups and gender in terms of the mean scores of transportation of the message.

Elaboration

7.   There is no significant difference between different messaging groups in terms of mean scores for elaboration of the message.

8.   There is no significant difference between males and females in terms of mean scores for elaboration of the message.

9.   There is no significant interaction between different messaging groups and gender in terms means scores for elaboration of the message.

Counter argument

10.   There is no significant difference between different messaging groups in terms of mean scores of counterarguments for the message.

11.   There is no significant difference between males and females in terms of mean scores of counterarguments for the message.

12.   There is no significant interaction between different messaging groups and gender in terms means scores of counterarguments for the message.

Delimitation

The study was delimited to

1.   The participants in the age group between 18-25 years.
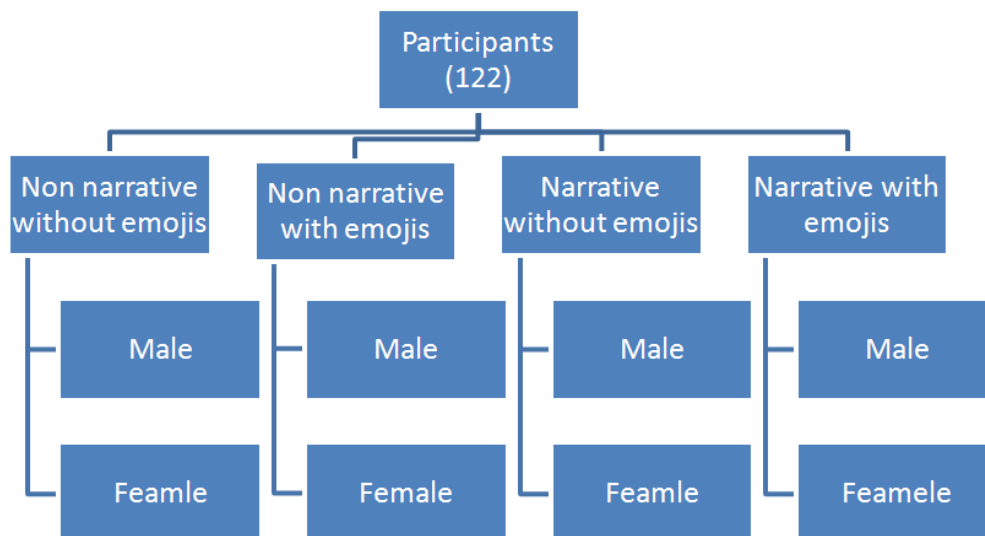
2.   The tri-city of Chandigarh.

Experimental Design

The study was conducted through 4x2 factorial designs. A message relating to COVID-19 vaccination was prepared by the investigators in the form of:

a.   non narrative without emojis, - Control Group-CG

b.   non narrative with emojis– Experimental group 1-EG1

c.   narrative without emojis - Experimental group 2-EG2

d.   narrative with emojis - Experimental group 3-EG3

The participants were distributed randomly into four different groups. Non narrative without emojis message was treated as control group and rest other type of message was treated as experimental groups. Gender acted as a classifying variable. The scores obtained from the questionnaire developed to answer questions related to messaging for all four groups were subjected to statistical treatment. Results and conclusions were drawn out.

Layout of the factorial design

Sample

The study was conducted on the sample of 122 participants in the group of 18-25 years taken randomly from tricity of Chandigarh. The sample comprised of male and female participants. The participants were randomly distributed among the control and experimental groups of messaging.

Tools used

1.   The investigators prepared a message relating to COVID-19 vaccination in the form of:
   - a.   non narrative without emojis,
   - b.   non narrative with emojis
   - c.   narrative without emojis
   - d.   narrative with emojis
2.   A questionnaire related to messaging.

Statistical tools

Using SPSS software, the data were subjected to statistical analysis. Descriptive and inferential statistics were calculated. Descriptive statistics such as mean, median, standard deviation were used to study the nature of the data. A two-way ANOVA and a t-test were computed to test the hypotheses.

Analysis of the data

Credibility

Table 1: Mean and standard deviation values for different types of messaging in terms of mean scores of credibility of the message

S.No.	Groups	Gender	N	M	SD
1	CG	Female	10	20.70	2.908
		Male	20	21.50	2.743
		Total	30	21.23	2.775
2	EG1	Female	20	21.75	3.626
		Male	10	20.00	3.682
		Total	30	21.17	3.677
3	EG2	Female	9	21.44	2.555
		Male	22	20.77	3.558
		Total	31	20.97	3.271
4	EG3	Female	24	22.79	2.377
		Male	7	20.00	6.532
		Total	31	22.16	3.778
TOTAL	TOTAL	Female	63	21.94	2.961
		Male	59	20.80	3.731
		Total	122	21.39	3.390

Table 2: Depicting F-value through Two- Way ANOVA in terms of mean scores of credibility of the message

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	95.999	7	13.714	1.207	.304
Intercept	44529.025	1	44529.025	3920.250	.000
Groups	3.245	3	1.082	.095	NS
Gender	30.383	1	30.383	2.675	NS
Groups x Gender	43.420	3	14.473	1.274	NS
Error	1294.894	114	11.359		
Total	57185.000	122			
Corrected total	1390.893	121			

1.   **Main effect of different messaging groups in terms of mean scores for credibility of the message**
        Table 1 shows the mean and standard deviation values of different messaging groups in terms of mean scores for credibility of the message. The mean values of different messaging groups, that is, control group, experimental group 1, experimental group 2, and experimental group 3, have been found to be 21.23, 21.17, 20.97, and 21.94 respectively. The standard deviation values for the said levels have been found to be 2.775, 3.677, 3.271, and 3.778, respectively. Table 2 shows the main effect of different messaging groups in terms of mean scores of credibility of the message. The F-value has been found to be .095 for 3 degrees of freedom, which is not found to be significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant

difference between different messaging groups in terms of mean scores for credibility of the message,' may be accepted.

2. **Main effect of gender in terms of mean scores for credibility of the message**

Table 1 shows the mean and standard deviation values for female and male participants in terms mean scores for credibility of the message. The mean values for 63 females and 59 males have been found to be 21.94 and 20.80, respectively. The standard deviation values for the females and males have been found to be 2.961 and 3.731, respectively. Table 2 shows the main effect of gender in terms of mean scores of credibility of the message. The F-value has been found to be 2.675 for 1 degree of freedom, which is not found to be significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant difference between males and females in terms of mean scores for credibility of the message,' may be accepted.

3. **First order interaction effect**

Table 2 shows the first order interaction effect between different messaging groups and gender in terms of mean scores of credibility for the message. The F- value for the first order interaction has been found to be 1.274 for 3 degrees of freedom, which is not found to be significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant interaction between different messaging groups and gender in terms of mean scores for credibility of the message,' may be accepted.

Transportation

Table 3: Mean and standard deviation values for different types of messaging in terms of mean scores of transportation of the message

S.No.	Groups	Gender	N	M	SD
1	CG	Female	10	16.50	2.014
		Male	20	15.30	3.526
		Total	30	15.70	3.120
2	EG1	Female	20	15.05	3.748
		Male	10	12.60	3.169
		Total	30	14.23	3.702
3	EG2	Female	9	16.44	3.745
		Male	22	16.14	3.536
		Total	31	16.23	3.538
4	EG3	Female	24	17.96	3.043
		Male	7	15.29	5.187
		Total	31	17.35	3.711
TOTAL	TOTAL	Female	63	16.59	3.411
		Male	59	15.15	3.800
		Total	122	15.89	3.661

Table 4: Depicting F-value through Two- Way ANOVA for different types of messaging in terms of mean scores of transportation of the message

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	242.365	7	34.624	2.862	.009
Intercept	24479.874	1	24479.874	2023.350	.000
Groups	121.235	3	40.412	3.340	.05
Gender	68.580	1	68.580	5.668	.05
Groups x Gender	22.766	3	7.589	.627	.599
Error	1379.250	114	12.099		
Total	32439.00	122			
Corrected total	1621.615	121			

4. **Main effect of different messaging groups in terms of mean scores on transportation of the message**

Table 3 shows the mean and standard deviation values of different messaging groups in terms of mean scores on transportation of the message. The mean values of different messaging groups, that is, control group, experimental group 1, experimental group 2, and experimental group 3, have been found to be 15.70, 14.23, 16.23, and 17.35, respectively. The standard deviation values for the said levels have been found to be 3.120, 3.702, 3.538, and 3.711, respectively. Table 4 shows the main effects of different messaging groups in terms of mean scores of transportation of the message. The F- value has been found to be 3.340 for 3 degrees of freedom, which is significant at .05 levels of significance. Hence, the hypothesis, 'There is no significant difference

between different messaging groups in terms of mean scores on transportation of the message.' may not be accepted.

Table 5: Post Hoc Test among different messaging groups, in terms of mean scores of transportation of the message

S.no.	Pairs	Mean difference	Standard error	Significance
1.	CG- EG1	1.47	.898	NS
2.	CG – EG2	-.53	.891	NS
3.	CG – EG3	-1.65	.891	NS
4.	EG1 – EG2	-1.99	.891	NS
5.	EG1- EG3	-3.12	.891	.01
6.	EG2 – EG3	-1.13	.883	NS

Post hoc test among different messaging groups' in terms of mean scores on transportation of the message showed that there was no significant difference between the control group and three experimental groups separately. Only experimental group 1 (EG1) showed a significant difference with experimental group 3 (EG3) at .01 levels of significance. Since the mean value of EG3 (17.35) is greater than the mean value of EG1 (14.23), EG3 is more effective in the transportation aspect of the messaging.

5. **Main effect of gender in terms of mean scores on transportation of the message**
Table 3 shows the mean and standard deviation values for female and male participants in terms of mean score on transportation of the message. The mean values for 63 females and 59 males have been found to be 16.59 and 15.15, respectively. The standard deviation values for the females and males have been found to be 3.41 and 3.80, respectively. Table 4 shows the main effect of gender in terms of mean scores on transportation of the message. The F- value has been found to be 5.668 for 1 degree of freedom, which is significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant difference between males and females in terms of mean scores on transportation of the message,' may not be accepted. Since the mean score of females is greater than the mean score of males so females are better in transportation aspect of messaging.

6. **First order interaction effect**
Table 4 shows the first order interaction effect between different messaging groups and gender in terms of mean score on transportation of the message. The F- value for the first order interaction has been found to be 0.627 for 3 degrees of freedom, which is not found to be significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant interaction between different messaging groups and gender in terms of means scores on transportation of the message,' may be accepted.

Elaboration
Table 6: Mean and standard deviation values for different types of messaging in terms of mean score for elaboration of the message

S.No.	Groups	Gender	N	M	SD
1	CG	Female	10	17.60	1.776
		Male	20	16.95	3.663
		Total	30	17.17	3.141
2	EG1	Female	20	15.65	1.927
		Male	10	14.60	3.534
		Total	30	15.30	2.562
3	EG2	Female	9	16.22	2.774
		Male	22	16.86	3.137
		Total	31	16.68	3.004
4	EG3	Female	24	17.04	1.899
		Male	7	17.43	1.718
		Total	31	17.13	1.839
TOTAL	TOTAL	Female	63	16.57	2.115
		Male	59	16.58	3.323
		Total	122	16.57	2.754

Table 7: Depicting F-value through Two- Way ANOVA for different types of messaging in terms of mean score for elaboration of the message

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	82.717	7	11.817	1.613	.139
Intercept	27325.572	1	27325.572	3730.145	.000
Groups	78.184	3	26.061	3.558	.05
Gender	0.704	1	0.704	.096	NS

Groups x Gender	12.555	3	4.185	.571	NS
Error	835.119	114	7.326		
Total	34430.00	122			
Corrected total	917.836	121			

7.   Main effect of different messaging groups in terms of the mean score for elaboration of the message

Table 6 shows the mean and standard deviation values of different messaging groups in terms of the mean score for elaboration of the message. The mean value for the different messaging groups, that is, control group, experimental group 1, experimental group 2, and experimental group 3, have been found to be 17.17, 15.30, 16.68, and 17.13, respectively. The standard deviation values for the said groups have been found to be 3.141, 2.562, 3.004, and 1.839, respectively. Table 7 shows the main effects of different messaging groups in terms of the mean score for elaboration of the message. The F- value has been found to be 3.558 for 3 degrees of freedom, which is significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant difference between different messaging groups in terms of the mean score for elaboration of the message' may not be accepted.

Table 8: Post Hoc Test among different messaging groups in terms of the mean score for elaboration of the message

S.no.	Pairs	Mean difference	Standard error	Significance
1.	CG- EG1	1.87	.699	.05
2.	CG – EG2	.49	.693	NS
3.	CG – EG3	.04	.693	NS
4.	EG1 – EG2	-1.38	.693	NS
5.	EG1- EG3	-1.83	.693	.05
6.	EG2 – EG3	.45	.687	NS

Post hoc test among different messaging groups' with different types of messaging in terms of mean score for elaboration of the message showed that there was a significant difference between the control group and experimental group 1 (EG1) at .05 levels of significance. Since, the mean score of the control group (17.17) was greater than the mean score (15.30) of the experimental group 1 (EG1), the control group performed better in terms for elaboration of the message.

Also, there is a significant difference between experimental group 1 (EG1) and experimental group 3 (EG3) at .05 levels of significance. Since, the mean score of experimental group 3 (EG3) (17.13) was greater than mean score (15.30) of experimental group 1 (EG1), the experimental group 3 (EG3) performed better in terms for elaboration of the message.

8.   Main effect of gender in terms of means scores for elaboration of the message

Table 6 shows the mean and standard deviation values for female and male participants in terms of the mean score for elaboration of the message. The mean value for 63 females and 59 males has been found to be 16.57 and 16.58, respectively. The standard deviation values for the females and males have been found to be 2.115 and 3.323, respectively. Table 7 shows the main effect of gender in terms of the mean score of elaboration of the message. The F- value has been found to be .096 for 1 degree of freedom, which is not significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant difference between males and females in terms of the mean scores for elaboration of the message,' may be accepted.

9.   First order interaction effect

Table 7 shows the first order interaction effect between different messaging groups and gender in terms mean score of elaboration of the message. The F- value for the first order interaction has been found to be 0.571 for 3 degrees of freedom, which is not significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant interaction between different messaging groups and gender in terms means scores for elaboration of the message,' may be accepted.

Counter argument

Table 9: Mean and standard deviation values for different types of messaging in terms of the mean score for counter argument of the message

S.No.	Groups	Gender	N	M	SD
1	CG	Female	10	9.80	4.050
		Male	20	11.95	5.511
		Total	30	11.23	5.104

2	EG1	Female	20	10.60	2.945
		Male	10	11.70	4.90
		Total	30	10.97	3.662
3	EG2	Female	9	10.67	3.279
		Male	22	14.82	5.058
		Total	31	13.61	4.944
4	EG3	Female	24	8.92	4.096
		Male	7	11.43	6.973
		Total	31	9.48	4.871
TOTAL	TOTAL	Female	63	9.84	3.642
		Male	59	12.92	5.494
		Total	122	11.33	4.862

Table 10: Depicting F-value through Two- Way ANOVA for different types of messaging in terms of the mean scores for counter argument of the message

Source	Type III Sum of Squares	Df	Mean Square	F	Significance
Corrected Model	454.615	7	64.945	3.077	.005
Intercept	12601.096	1	12601.096	596.992	.00
Groups	86.039	3	28.680	1.359	NS
Gender	153.295	1	153.295	7.263	.01
Groups x Gender	31.261	3	10.420	.494	NS
Error	2406.270	114	21.108		
Total	18516.00	122			
Corrected total	2860.885	121			

10.   Main effect of the different messaging groups in terms of the mean score for counter argument of the message

Table 9 shows the mean and standard deviation values of different messaging groups in terms of the mean score for counter argument of the message. The mean values of different messaging groups, that is, control group, experimental group 1, experimental group 2, and experimental group 3, have been found to be 11.23, 10.97, 13.61, and 9.48, respectively. The standard deviation values for the said levels have been found to be 5.104, 3.662, 4.994 and 4.871, respectively. Table 10 shows the main effect of different messaging groups in terms of mean scores for counter argument of the message. The F- value has been found to be 1.359 for 3 degrees of freedom, which is not significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant difference between different messaging groups in terms of the mean score for counter argument of the message.' may be accepted.

11.   Main effect of gender in terms of the mean score for counter argument of the message

Table 9 shows the mean and standard deviation values for female and male participants in terms of the mean score for counter argument of the message. The mean values for 63 females and 59 males have been found to be 9.84 & 12.92, respectively. The standard deviation values for the females and males have been found to be 3.642 and 5.494, respectively. Table 10 shows the main effect of gender in terms of the mean score for the counter argument of the message. The F- value has been found to be 7.263 for 1 degree of freedom, which is significant at .01 levels of significance. Hence, the hypothesis, 'there is no significant difference between males and females in terms of the mean score for counter argument of the message,' may not be accepted. Since, the mean score of males (12.92) for counter argument of messages was greater than for females (9.84), the males are better in terms of counter-argument for messaging.

12.   First order interaction effect

Table 10 shows the first order interaction effect between different messaging groups and gender in terms of the mean score for counter argument of the message. The F- value for the first order interaction has been found to be 0.494 for 3 degrees of freedom, which is not significant at .05 levels of significance. Hence, the hypothesis, 'there is no significant interaction between different messaging groups and gender in terms of the means score for counter argument of the message,' may be accepted.

III.   Results

1.   No significant difference was found in the credibility and counter argument among the mean scores of different types of messages.
2.   Text messages containing narrative with emojis (EG3) showed better transportation features than non narrative non emoji (CG) text messages.

3.   Non narrative non emoji (CG) text messages are better at elaboration in text messaging as compared to non narrative with emoji (EG1) text messages.

4.   Also, text message, with narrative and emojis (EG3) is better at elaboration as compared to non narrative with emoji (EG1) text messages.

5.   There was no significant difference in credibility or elaboration between gender mean scores.

6.   Females are better at the transportation aspect of messaging as compared to males.

7.   Males are better at counter-argumentation than females.

IV.   Discussion

The study intendeds to explore the effects of narratives and emojis in text messages on the efficacy of vaccine messaging through four distinct variables: credibility, transportation, elaboration, and counter-arguing. The statistical results were mixed when considering the main effects of different messaging groups as well as the overall effect of gender on the mean scores of the chosen variables. The first-order interaction effect between gender and messaging groups was found to be non-significant in all four variables. The main effect in terms of credibility was statistically not significant at .05 levels, suggesting that different messaging styles had no effect on the participants' perceived credibility of the message. The overall effect of gender was also not significant. This finding is in contrast to the one presented by Willoughby & Liu (2018), in which participants in the no-emoji group reported more credibility for text messages related to physical health than the ones in the low-emoji or high-emoji groups. One possible explanation for this is the particular nature and timing of our study. When shown COVID-19 vaccine related messages, participants are less discernible when it comes to the credibility of different messaging styles because of the novel and extraordinary nature of the situation. The study was also conducted at a time when India was reeling from the devastating second-wave of COVID-19. It could change participants' perception of credible messaging related to COVID-19 vaccines when compared to the more ordinary context of the aforementioned study.

To better understand the impact of vaccine-messaging styles on credibility, we recommend similar studies be conducted when the relevance of COVID-19 has subsided. The data would help improve India's health-awareness policy on vaccines in general, in addition to a health-emergency.

In the post-hoc test, we see statistical significance when comparing experimental group 1 to experimental group 3, among different messaging groups in terms of mean scores for transportation. Experimental Group 3, which presents the two messages as a narrative with emojis, has a greater mean score than experimental group 1 which presents the messages as a non-narrative with emojis. This finding demonstrates the inclusion of narrative elements in the messages positively impacting the transportation. Greater transportation in messaging is associated with positive health outcomes (Banerjee & Greene, 2012), and a meta-analysis of the narrative's transportation effects has already found a link between transportation and behavioral intentions (van Laer, de Ruyter, Visconti, & Wetzels, 2014). Therefore a focus on narratives and storylines while curating vaccine-awareness messaging can become a viable strategy for effective health communication.

Upon studying the main effect of Gender in terms of mean scores of transportation, we discover that the mean score of the 63 female participants is greater than the mean scores of the 59 males who were part of the experiment. The effect of gender is statistically significant. It supports the prior research which studied the transportation levels of females and males and found that female participants reported higher levels of transportation compared to male participants (Banerjee & Greene, 2012).

While studying the mean scores of counter arguing, we find that the main effect of different messaging groups and the first order interaction effect yield statistically insignificant results. This result runs counter to the finding of Willoughby & Liu (2018) that counter arguing significantly differed between participants in the narrative and non-narrative conditions, with participants in the narrative condition reporting greater counter arguing than participants in the non-narrative condition. One possible reason behind this might be that transportation differed significantly between different messaging group, which wasn't the case in the aforementioned study. Narratives that greatly transport individuals can reduce counter-arguments (Slater & Rouner, 2002), so perhaps the greater transportation of the narrative messaging groups when compared to non-narrative messaging groups ensured that the main effect for counter-argument remained statistically insignificant.

The main effect of gender in terms of mean scores of counter-argument shows a statistically significant difference, with males having a greater mean value than females by 3.08 units. This supports the widely observed phenomenon of females scoring higher levels of agreeableness in the Big Five Personality Test than males (Weisberg, Deyoung, Hirsh, 2011). To counter this, health authorities should curate vaccine awareness messages for males according to variables like transportation that have been shown to reduce counter-arguing.

Differences in mean scores of elaboration across different messaging groups are also statistically significant. The Post Hoc Test performed by comparing mean scores of different messaging groups, concluded that participants of the control group (non-narrative without emojis) reported more elaboration than participants

of Experimental Group 1 (non-narrative with emojis). Furthermore, participants of Experimental Group 3 (narrative, with emojis) reported more elaboration than Experimental Group 1 (non-narrative with emojis). The results demonstrate that narrative intervention in messages has positively impacted elaboration amongst participants, whereas the presence of emojis has shown a negative effect on elaboration.

The inclusion of narrative elements in COVID-19 vaccine awareness messages will aid in influencing those readers who are not motivated by the topic, i.e. those who are processing the information peripherally (Petty & Cacioppo, 1986). When peripherally processing a message, individuals tend to get influenced by external cues other than the information itself. The unique writing style of narrative based messages can become one of those external cues. Although the changes that peripheral processing brings to health attitudes may be short-lived (Petty & Cacioppo 1986), the immediate nature of the COVID - 19 pandemic should ensure that the effectiveness of such persuasion is reduced minimally.

V. Conclusion

In order to determine the optimal style of COVID-19 vaccine awareness in the form of text messages, we studied the effects narrative elements and emojis in text messages have on four distinct variables by analyzing the mean scores for each for every messaging group. Statistical analysis showed only the mean scores of transportation and elaboration to differ significantly across different messaging groups. Upon conducting a Post-Hoc test for both variables, it was found that the inclusion of narrative elements in the text messages positively impacted both transportation and elaboration of the message for the participants, whereas the inclusion of emojis negatively impacted the elaboration of the message.

Analysis of the main effect of gender in terms of mean scores showed stastical significance in the cases of transportation and counter-arguing. The mean value of transportation was greater in females than in males . Mean values for counter-arguing was greater in the case of males than in females.

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