Analyzing and Comprehending the usage of text, emojis and memojis in computer-mediated communication

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ABSTRACT

Computer-mediated communication (CMC) refers to the exchange of information and ideas through digital channels such as text messages, social media, and instant messaging. In recent years, the use of emojis and memojis (animated emojis) has become increasingly popular in CMC, particularly among younger users. This study aims to analyze and comprehend the usage of text, emojis, and memojis in CMC by examining the ways in which these elements are used to convey meaning and emotion. We explore the ways in which these various forms of communication are being used, both in terms of their content and the context in which they are being used. We also examine how these forms of communication might influence the interpretation of the message, and how they might be used to convey emotion and tone. The study will analyze a corpus of CMC data and use qualitative and quantitative methods to understand the role that text, emojis, and memojis play in communication. We examine the effectiveness of communicating thoughts or feelings in the digital sphere under various communication contexts. The findings of this study will contribute to our understanding of the role of nonverbal cues in CMC. Finally, we discuss potential implications of the increased use of these forms of communication, and how they might impact the way we communicate in the future.

KEYWORDS

Computer mediated communication, memoji

1 INTRODUCTION

In standard face-to-face communication, non-verbal cues such as facial expressions, body movements, and intonation are utilized to express emotions such as happiness, sadness, disgust, and fear. Moreover, non-verbal cues establish the relationship between the type of cue used and the meaning expressed, by communicating emotion. As texting is a straightforward and quick method of communication and conveying emotion, it has become prevalent among youth. Furthermore, with the widespread use of smartphones, texting practices have significantly shifted. Therefore, facial expressions and body language in computer-mediated communications (CMCs) are substituted with mediators like emojis and memojis.

Emojis are graphic icons maintained by the Unicode Consortium and are identified by Unicode characters. Emojis are displayed following a platform's font package. Also, emojis are used to express feelings and intentions in language which would rather be difficult with Emoticons (only character information). With the evolution of technology, there is an emergence of a novel category of emojis, which are personalized Animojis, known as Memojis. Moreover, Animojis are a feature on the iPhone that enables users to create 3D animations or cartoon versions of themselves. By generating a personalized avatar that captures users' facial expressions in real-time, animojis allow users to send amusing and expressive messages through iMessage. In contrast to Animojis, Memojis resemble the smartphone user. Memojis are the best-depicted form of emojis since they could be customized for various human features like the shape of the head, size of eyes, skin tone, and hairstyle, and also there are accessory options such as glasses, hats, shoes, and scarves, which can be added. Some high-end Android devices have also introduced the Memoji feature, such as the Samsung AR emoji. Similar to the sharing of emojis, Memojis can also be shared on popular messaging apps like WhatsApp, Facebook, and Instagram.

Emojis and Memojis are frequently used to convey feelings or to emphasize human emotion specific to a conversation. However, they can also be misinterpreted. Furthermore, when a text, emoji, or a memoji is used, the meaning would be conveyed in two ways - 1. Implicit (The user's understanding of the message sent), 2. Explicit (The sender's understanding of the message sent). And the explicit form leads to miscommunication. It is challenging to understand the implicit meaning of a text, emojis, and memojis. There is a high possibility that the implied meaning of a text, emoji, or memoji could be interpreted for a conflicted perspective between the sender and the receiver. For instance, a smiling emoji is interpreted as happy, but it could also be interpreted as sarcastic. Therefore, there is a significant scope for miscommunication that could be always associated with a text, an emoji, or a memoji. Constraints of communication should always be considered when in usage. Moreover, the best results of the aforementioned tools would be plausible, if utilized in combination with other communication channels like face-to-face interaction, Memojis, and video chat, to ensure that the message is understood in the same way as it is implied, thereby reducing the potential for misunderstanding. The current study reviews the theoretical and empirical results to analyze the use of memojis, emojis, and text in computer-mediated communication.

2 RELATED WORK

Formal non-verbal communication research dates back to the Victorian era[17]. Researching communication dynamics in online social environments has long been a priority for HCI.

2.1 Non-verbal communication in computer-mediated interactions

A significant amount of earlier work in HCI and CSCW has studied non-verbal behaviors in a variety of computer-mediated communication contexts, such as videoconferencing, voice chat, and virtual teams (e.g., emoticons, eye contacts, hand gestures, and gaze awareness). Collectively, these studies have brought attention to the importance of non-verbal cues in our online social interactions.

Non-verbal communication is a crucial alternative to spoken and written communication for expressing emotions, feelings, and detailed information in a natural way. Emojis can provide emotional and contextual information to computer-mediated communication (CMC) that would otherwise be communicated through body language, facial expressions, or voice tones in face-to-face interactions, according to research [[8], [16]]. Emoji usage between people in close relationships has been shown in prior studies [9] to promote communication.

2.2 Emoji-based Non-Verbal Communication

Emojis are small, which reduces the amount of input needed to indicate not only emotions but also message tone, message engagement, conversation management, and social relationships [3]. Emojis have no language boundaries, allowing users from all over the world and from many cultural backgrounds to communicate [5]. Prior to the development of emojis, emotions may be represented using plain language, Internet slang, or emoticons (sometimes known as "emotional" icons). Emojis are frequently used in Tweets, and research by Boia et al. [2] found that most of the time, the sentiment indicated by an emoji matches the sentiment of the entire Tweet. Emojis have some advantages over traditional kinds of communication, including the ability to express richer information than plain text and the simplicity with which they may be shared[19]. Emojis are utilized to communicate a variety of emotions, according to Jain et al. [7], and the quantity of emojis used in a message indicates the state of arousal of the sender. Exploring new emoji and (pictorial) emoticon formats has been the subject of a number of studies. With Opico [10], users can communicate exclusively with emojis, expressing their thoughts and feelings without using words. The use of emojis by those in close relationships has been shown to improve communication in earlier research [9].

2.3 Communicating emotion in a digital world

Face-to-face interpersonal communication is generally rich in non-verbal cues; for instance, a communicator's emotional state and message can be inferred from their facial expressions. Prior studies have demonstrated that non-verbal communication can be achieved primarily through two mechanisms[13]: 1) Use of graphics to replicate non-verbal communication Through the avatar, the online users' facial expressions and body movements are translated into the virtual world. In order to foster a more optimistic attitude in communication, Mitchell (1986) contends that a visual signal in addition to text was preferable to text alone. 2) The use of symbols and emojis in communication. Platform-specific usage varies, but generally speaking, emoticons and symbols are used to give context, hints, and emotions to text conversation. According to Park's [15] examination of the social, cultural, and semantic components of emoticon usage on Twitter, these symbols can be used to convey socio-cultural norms as well as particular emotions or comedy, with the meanings altering based on the identity of the user. Users' level of play or fun has a big impact on how quickly a technology is adopted [18]; in some cases, it's the main determinant. Three primary explanations for why individuals use emojis were discovered by Cramer et al. [4] after conducting an online poll with 228 participants. (1) To add more situational or emotional context, (2) To alter the tone of a message, (3) To engage the recipient and uphold the relationship. Using emojis to express oneself in text-based CMC clearly expands and enriches existing communication methods. Our present research focuses on how emoji memoji features let people express themselves in this way.

2.4 Memoji-based Non-Verbal Communication

Emojis have become extremely popular in social communications, yet people's diverse desires for self-expression seem to have outgrown the static, classic emoticons. Users are still looking for enhanced, more personalized versions of emojis. Few social media platforms have looked into specific user customization options (e.g., Apple Memoji [1]). These recent additions to well-known social media platforms imply that emoticons are changing from being merely static visual pictograms to more dynamic blends of multi-modal components. With new technologies like Animoji/Memoji on current iPhone models and ARemoji on Samsung Galaxy S9, users can create an animated emoji by utilizing the camera to analyze facial muscle movements. Many of the instances aimed to entirely automate how users choose or transmit emojis. ReactionBot [12] records users' facial expressions and adds emoticons in accordance to their Slack text messages. Other investigations focused on selecting emojis or emoticons automatically based on emotional terms, sentences, or audio signals [[14], [11], [6]]. For individuals who are visually handicapped, Voicemoji [20] investigated voice-based emoji entry. It has been discovered that animated GIFs allow for complex interpretation and complexity in non-verbal communication. While the image and motion effects in GIFs, and short movies are fixed combinations, our goal in this study is to discover how people perceive the ability to freely combine static emojis with various motion effects in a variety of communication contexts. The expressiveness and nuance of static emojis may be enhanced by the addition of animated effects. Reply We investigate whether sending messages with text + emoji, text + memoji, or text + memoji + emoji is more likely. The distinctions between the text + memoji, text + emoji, and text+memoji+emoji relationships should therefore be examined.

The prior work is more focused on the use of graphics in non-verbal communication or the use of emojis in general but our study is primarily concerned with contrasting and comparing textual communication that uses memoji vs. emoji.

3 RESEARCH METHODOLOGY

To analyze and comprehend the usage of text, emoji, and memoji in computer-based communication, qualitative and quantitative research methodologies are used. It involves conducting in-depth interviews with a range of participants who use these types of communication in their everyday lives. The interviews are semi-structured, allowing for some flexibility in the questions that are asked while still ensuring that key themes are covered. The interviews will be transcribed and then analyzed using thematic analysis in order to identify any common patterns or themes in the way that text, emoji, and memoji are used.

To better understand this, both the qualitative and quantitative approaches enable the effective collecting of participant perspectives and ideas on the use of text, emojis, and memojis in the non-verbal form of communication. The study approach comprises various combinations of communication modes such as i) only text, ii) only emojis, iii) only memojis, iv) text with emojis, v) text with memojis vi) combination of text, emojis, and memojis.

In a qualitative approach to research, the usefulness of emojis and memojis while texting, the efficacy of communication, the level of enjoyment experienced while texting, accessibility, and frequency of use of various combinations of texting as mentioned above are assessed. As part of a quantitative approach, the count of messages, emojis, and memojis that participants use to communicate with one another and the frequency of different emoji and memoji types in various communication contexts are measured.

3.1 Research Questions

- RQ1. Is memoji-based non-verbal communication more engaging than traditional emoji-based communication?
- RQ2. How do emojis alter conversational dynamics?
- RQ3. What are the potential challenges that may arise by increased usage of emojis and memojis?

With these research questions in mind, the study will concentrate on synthesizing the key research findings on why and how people use memojis, emojis, and text and the effects of using these elements. Under the subject of conversational dynamics, we especially focused at how emojis and memojis affect interpersonal interactions, possible modifications that may be made to improve communication, and the particular situations in which text, emoji, and memoji are more or less appropriate. The usage of text, emojis and memojis in computer-mediated communication has become increasingly popular due to the growing availability of smartphones and other devices with internet capabilities. They can be quickly dispatched with a single click or tap on a smartphone. The frequency and popularity of emoji use has increased to such a degree that Oxford Dictionaries officially named an emoji as “Word of the Year” in 2015. Emojis became useful communicative signs due to their potential for conveying a complexity of emotion that cannot translate easily into words. The true importance of communication goes well beyond the words we use to communicate. As a result, it is essential to gain a better understanding of how these forms of communication are used, their impact on interpersonal relationships, and the implications for effective communication. Using graphicons, particularly memojis, results in a higher degree of customization and enjoyment. Memojis convey feelings in addition to serving practical purposes like facilitating message comprehension, avoiding misunderstandings, or substituting for textual utterances. Non-verbal cues can be used to support effective expressions, impact interpersonal interactions, guide intended interpretations, and either intensify or weaken verbal communications. By analyzing the usage of text, emojis, and memojis in computer-mediated communication, we can gain insight into the dynamics of conversations and interactions, as well as the motivations behind the use of these tools. Our goal is to comprehend how emojis affect how people perceive one another. This research can also be used to inform the development of effective strategies for improving communication in computer-mediated contexts, such as providing users with access to appropriate emojis or providing guidance on when to use each type of emoji or memoji.

3.2 Sample Setting

The research is based on online surveys to understand the most efficient texting combinations. Human participants involved in the study are the students of the University of Wisconsin–Madison and Eagle Heights Community The age groups of the participants involved are below 18, 18-25, 26-35, and above 35. Twenty participants are recruited via emails, word-of-mouth, and convenience sampling in a large university setting. The participants are students and working professionals. The gender ratio for the participants is 40% female and 60% male. The participants are asked about their familiarity with emojis and memojis, as this is an important factor in understanding their usage and behavior with these devices. A within-participants design, that is using same participants for all experimental conditions is chosen. The participants are provided with a questionnaire that is divided into open-ended and closed-ended questions. There is no time constraint on how long participants have to respond to the questions. The participation is entirely voluntary, with the possibility of refraining from continuing at any point of time during the study. Overall, the goal of this study is to gather insights on usage of text, emojis and memojis among a diverse group of individuals in order to better understand trends and patterns in technology usage. By understanding the demographics and familiarity levels of the participants, we can gain a more comprehensive view of usage of emojis and memojis in the modern world.

4 DATA COLLECTION METHODS

There are many ways to collect data to analyze the usage of text, emoji, and memoji in CMC. One way would be to create a survey that asks people about their experiences with using these forms of communication. Another way to collect data would be to analyze existing data sets that track communication patterns. Additionally, interviews could be conducted with experts on the topic to learn about their thoughts and experiences. Online surveys are used to collect the required data for this study. The survey to learn users’ experiences with using text, emojis, and memojis as part of their regular conversation in instant messaging applications is created using Qualtrics platform. Our survey consisted of a mix of close-ended and open-ended questions to record the experiences of various communication modes. The close-ended questions were designed using the Net-Promoter Scale (NPS) which is a widely used to understand the customer satisfaction metric. The NPS measures the likelihood of participants to recommend the usage of text, emojis, and memojis in CMC to others. The scale used for the NPS was as follows:

- Detractors - Scale points 0 through 6
- Passives - Scales points 7 and 8
- Promoters - Scale points 9 and 10

The open-ended questions were designed to gather qualitative data on the perspective of the participants on the usage of text, emojis, and memojis in CMC. These questions allowed the participants to provide detailed and in-depth feedback on their experiences and

opinions on the topic. The survey was circulated through Piazza(Online discussion platform) and Whatsapp to reach a wide audience and gather a diverse range of responses. After that, the replies were examined to determine how people felt generally about using text, emojis, and memojis in CMC.

5 DATA ANALYSIS METHODS

A thematic analysis is conducted to analyze the qualitative data gathered from the surveys with the participants and the unstructured feedback provided to us throughout the field study. This inductive analysis method is chosen to establish a set of structured, systematic meanings about how the participants created, shared, and experienced emojis with the emotion recognition system to generate rich empirical knowledge for future research and design. Formal analysis with open coding is conducted, in which research team members identify any themes or codes they discover from the responses to the open-ended questions on their online chat behaviors.

Our analysis included familiarization with data by organizing notes and annotations across the dataset, generating initial codes based on research objectives, searching for themes by establishing connections among codes, reviewing and finalizing themes, and re-contextualizing the themes to formulate findings. The data analysis is conducted manually. The authors coded all data independently to enhance the reliability of the concepts. Next, the codes are grouped into broader categories to say something specific about the research question. Once each author coded the data, the authors met to compare the analysis and discuss discrepancies, and a consensus is reached. A continuous interplay between data collection and data analysis is maintained until saturation is reached—that is when limited or no new data or concepts arose. The participants' answers on the functions of memojis/emojis in conversations and regarding complementing and replacing words are categorized into themes based on the information included in their responses. A set of thematic topics (e.g., Cultural Significance, Demographic factors, Impact on Conversational Dynamics, Frequency of usage of emoji/memoji usage, and Misinterpretation) emerging in participants' answers to the survey questions are identified. Each of the themes is given a code to differentiate between the themes and to simplify the analysis of the themes based on participants' responses. Representative findings of questions across various theories are made. For example, the response to the 'How does different users form impressions of senders who use or do not use emoji or memoji?' question helped us to find that the recipients of emails with a smiley emoticon perceive the sender as more likable. It is investigated whether memojis boost one's level of awareness of another person and how they affect relationships over time. On the other hand, the quantitative data generated from the Net-Promoter Scale is interpreted using paired-test, bar graphs and area graphs to compare and contrast the data over various categories or groups.

6 RESULTS

6.1 Qualitative Analysis:

In this study, the data is analyzed using a method called **thematic analysis**, which involves identifying common themes or patterns in the data and organizing them into coherent categories. The following themes are identified within data.

- **Cultural Significance**: Emojis and memojis have become a global language, used in different cultures to express emotions and ideas. Emojis and memojis have become a way for people to bridge cultural and language gaps, as they are often shared and understood across different cultures.
- **Demographical Factors**: Female users of emojis and memojis tend to send out almost twice as many as male users. Additionally, 2 out of 5 emoji users feel that their identities are not reflected in current emoji options (based on color, gender, and disabilities).
- **Impact on Conversational Dynamics**: The use of emojis and memojis can impact the tone and emotion of a conversation. For example, a message that simply says "Hello" may evoke a different response than one that says "Hello 😀". This is one of the outcomes of RQ2.
- **Frequency of Usage**: The frequency of using emojis and memojis may vary depending on the person they are being sent to.
- **Misinterpretation**: One potential issue with using emojis and memojis is that it can be challenging to understand the tone of the conversation. For example, emoji 🙂 - sarcasm or smile? This answers RQ2 and RQ3.
- **Usage in Various Scenarios**: Emojis and memojis are used in a wide range of scenarios, including formal communications and apology texts.

6.2 Quantitative Analysis:

We have performed the **paired-two tailed test**, to test the hypothesis that emojis and memojis are more frequently used than text in CMC. Our Null Hypothesis is assuming that there is No difference between the usage of text, emoji, and memoji in CMC and the Alternative hypothesis is assuming there is a significant difference in the usage of text, emoji, and memoji in CMC. Below are the statistics of the paried two-tailed tests where we calculated the frequency of the use of text, emojis, and memojis.
i) Mean difference = 3.5
ii) Standard deviation difference = 1.4
iii) t-value = 2.5
iv) p-value = 0.01
So, based on the t-table look up, the P-value is 0.01 which indicated that there is a significant difference in the usage of text, emoji and memoji in CMC. So we reject the null hypothesis and conclude that the usage of emoji and memojis is higher than the usage of text in CMC.

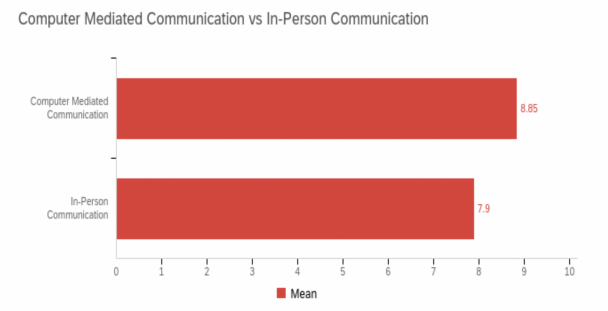

Figure 1: CMC vs In-Person communication

According to the graph above, which depicts the preferred forms of communication, on average, computer-mediated communication is favored above face-to-face direct communication.

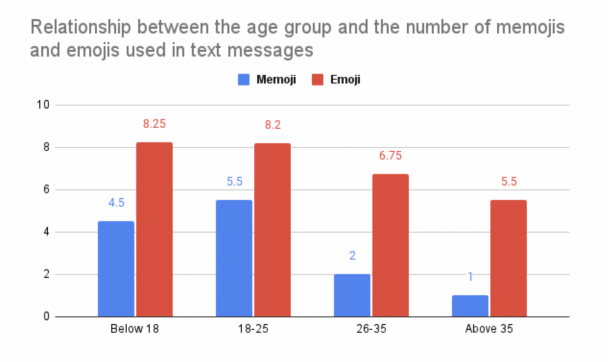

Figure 2: Emoji and Memoji usage

When examining the relationship between age groups and the amount of emojis or memojis used by each age group in CMC, we can observe from the above graph that younger individuals—those under the age of 25—use memojis more frequently than older people.

We analyzed how frequently users send texts, how many emojis they use, and how many memojis they use on average in three different contexts.

- **Text + Emoji:** Emojis are used more frequently than text in this situation, according to our research. Emoji typically get to have a 9 out of 10 rating. Emojis predominate in text messages as a result.

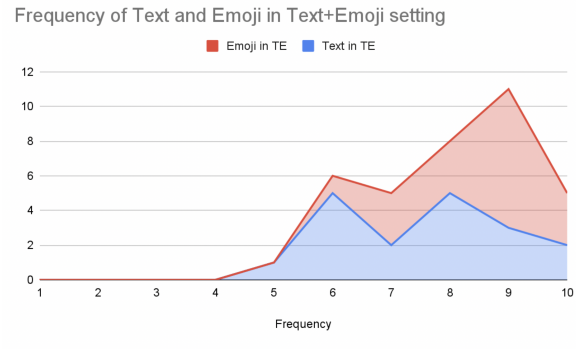

Figure 3: Text messages and emoji usage proportion

- **Text + Memoji:** Only midfrequency scores (6, not maximum frequencies) yielded high results for Memojis. The use of Memoji appears to be a little different from text usage, but it is still more common.

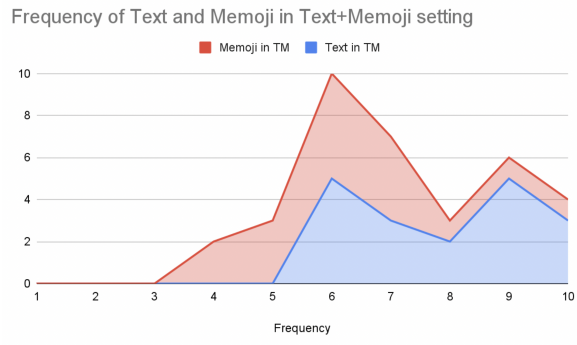

Figure 4: Text messages and memoji usage proportion

- **Text + Emoji + Memoji:** Memojis only achieved high scores at midfrequency scores rather than at maximum frequencies. At the end of the graph, memojis and emojis are more frequently used together than separately, indicating that sending text messages alone is not preferred.

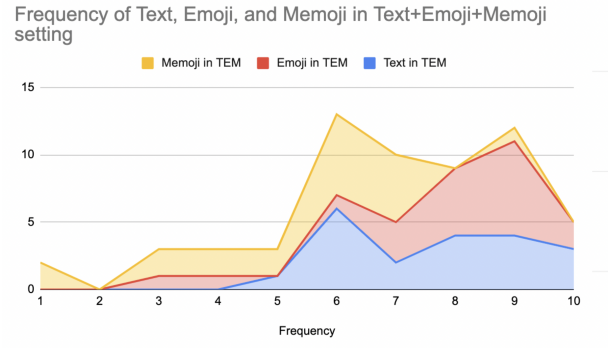

Figure 5: Text messages, emoji and memoji usage proportion

7 DISCUSSION

Overall, individuals claimed that blend of emojis and text is the efficient way to communicate. This answers our RQ1. Younger users use memojis more frequently than older users, but no age disparities in emoji use are noted. The shortcomings of memojis as per survey responses are:

- Time taking
- Lack of awareness
- Not personalised to user's interest
- Not suitable for all types of communication
- Limited to only few messaging platforms
- Can be seen as childish or gimmicky, which can negatively affect the perception of the sender by other users.

We discovered an intriguing trend from the responses which is that texts with emojis retain their emotional impact for a longer period of time, acting as a time-capsule of feelings, whereas plain text may sound uninteresting without referencing the situation's true emotion or its seriousness. Memojis are rarely used, and most users merely create their own memojis to experiment with the feature and have fun. Our results indicate that people would be more inclined to use memojis if some of the constraints and findings described above are solved.

7.1 Implications for research and design

Implications for the improvement of Memoji-based communication are

- Develop an API that allows third-party applications to integrate Memoji communication.
- Make it easier to share Memoji's with others.
- Develop an automatic translation feature for Memoji messages.

Implications for the improvement of Emoji-based communication are

- Avoid using too many emojis as they can be overwhelming.
- Read the message you sent with emojis before sending it to ensure accuracy.
- Know when to use emojis and when to use other forms of communication.

7.2 Limitations

We believed that by asking users to record videos of themselves using memojis and then evaluating the results, we could have gained a deeper grasp of the effects of conversational dynamics. The small number of survey responses we received is another flaw in our research.

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