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Meaningful Emoji: A Preliminary Exploratory Study of Graphic Symbols Usage for Health Communication

Tingyi S. Lin and Sih-Wei Li

National Taiwan University of Science & Technology, Taipei, Taiwan, ROC

ABSTRACT

Emoji have become an important component of visual language since they were officially introduced into the Unicode Character Database in 2010 and have become commonplace in most people's lives. These graphic symbols were popularly used worldwide due to their widespread use on social media platforms. More and more researchers have also used emoji as stimulus cues to explore the relationship between emotions and attitude in the fields of communication, online behavior, health, food safety, and other fields of study. Gboard, a virtual keyboard developed by Google, announced Emoji Kitchen in 2020 for Android users, and now also open to iOS users, and even launched a web version for computer users to use. Emoji Kitchen is a special feature that allows users to combine two different emoji symbols into brand-new ones. By using Emoji Kitchen as a generator tool, this study aims to investigate which key visual elements can replenish the emoji items to meet users' communication needs, particularly in the health context. This study firstly presumes emoji as elements of visual language to represent a noun, a verb, and an interjection. Secondly, an exploratory investigation was conducted to test how people make sense of the relationship between multiple emoji, within which to demonstrate how various arrangements of emoji affect the semantic meanings. Results show that current standardized and widely used emoji are inadequate for users to express freely online in the context of health issues. What to choose and how to use the emoji when people express their emotions in the context of health were defined. The consensus in visual preferences was initially discovered. Our previous studies have proved that emoji are highly capable of promoting more comprehensible and persuasive information communication, as well as improving reading speed. This study further details about how emoji play roles as vital components of visual language in communication.

Keywords: Emoji, Graphic symbols, Health communication, Social media, Visual language, Health information

INTRODUCTION

Emoji, emoticons, and symbols of facial expressions are considered to be highly similar to facial stimulation in human brain and are thereby regarded as a nonverbal communication tool, according to Yuasa et al. (2011) and Bai et al. (2019). Meanwhile, emoji have become an important component of visual language since they were officially introduced into the Unicode Character Database in 2010 and have become commonplace in most people's lives.

These graphic symbols were popular used worldwide due to their widespread use on social media platforms. Evidences also showed that emoji contribute to the semantic comprehension of information (Ousterhout, 2017). More and more researchers have also used emoji as stimulus cues to explore the relationship between emotions and attitude in the field of communication, online behaviour, health, food safety, and other field of studies. Particular in health issues, for example, Gaube et al. (2018) used emoji to impetus self-monitor and to reinforce proper hand hygiene behaviour. Troiano and Nante (2018) also used emoji as a communication medium between doctors and patients to help the patients better manage their own health. Furthermore, Lin & Lou (2023a) determined that the persuasive effects of health information considerably differed from with or without emoji versus from official versus unofficial sources, and the scientific and systematic application of emoji can stimulate perceptions and behaviours (Lin & Lou, 2023b). That is, even though emoji is comparatively small in visual symbols, they still can reduce message recipients' cognitive load and strengthen their behavioural intention if used strategically and appropriately. Above literature all highlight the relevant role of visual elements in the communication of health information, indicating that the scientific and systematic application of emoji is clearly an effective method to stimulate recipients" emotions and behaviours.

Gboard, a virtual keyboard developed by Google, had announced Emoji Kitchen in 2020 for Android users, and now also open to iOS users, and even launched a web version for computer users to use. Emoji Kitchen is a special feature that allows users to combine two different emoji symbols into a brand new ones. The ultimate goal of current research is to explore key feature components for emoji to be effectively recognized so as to aid health-related emoji for ease of use. To reach this goal, this preliminary study aims to investigate what key visual elements to fill up the emoji items to meet users' communication need. To do so, we ran a two-step exploratory experiment to identify high demand terms from users' viewpoint and to examine how two existing emoji develop visual semantic comprehension to users. Emoji have become convenient visual cues not only in social media but also increasingly on informal document, especially for certain useful purposes. With constantly developing technology and ubiquitous online service and communication, it is important to have more understanding on the effects of and the usage of visual elements such as emoji.

METHOD

In order to search for key visual elements and fill a vacancy of health-related emoji, this two-step exploratory experiment first presumed emoji as elements of visual language to represent a noun, a verb, and an interjection in the context of health and environment. Scenarios such as disease (feeling, symptom, medical items, etc.), nutrition (food, drink, substances, etc.), self-monitoring (condition, gears, activities, etc.), environment (circumstance, status, equipment, etc.), and hygiene (measure, supplies, sanitation, etc.) were brainstormed and listed. This study identified thirty-six high-demand terms. We investigated and excluded corresponding emoji that existed in Emoji

Encyclopedia. The remaining terms were used as pre-test experimental questions. We invited three subjects to operate emoji kitchen in person to operate and to create. When subjects think there is no relevant current emoji available related to the term, the term is excluded from the formal experiment in the next step. Five high-demand interjections regarding health and environmental circumstances and emotions were selected for the formal experiment: disgusting, dangerous, dirty, scary, and cosy regarding the environment category; and pungent, clean, nervous, harmful, and safe regarding the health category. This step provides a backlog adjustment for the number of pictogram sources along with the increasing availability of emoji collection.

In step two, participants were invited to create new emoji items via Emoji Kitchen as a generator tool to avoid drawing barriers. The formal experiment under an efficient execution via Emoji Kitchen ran from December 2023 to January 2024, after the optimization of the experiment procedure and its operation. Insufficient but high-demand emoji were identified in the following session. Visual elements that are easy of association for communication were also initiatively explored in this study. Twelve valid responses out of fifteen were collected successfully.

RESULTS

The results show that half subjects (50.0%) found challenges in free access to materials. One-third of subjects (33.3%) thought there was a gap from what they imagined, and 16.7% of subjects felt satisfaction with what Emoji Kitchen had generated. This outcome not only proved that emoji related to health issues require development, but also reflected the power of current generator engines—on the one hand the powerful generator tools can assist image creation efficiently; on the other hand, this experiment again echoed several studies (DeSiano and DeSiano, 1995; Kwan et al., 2023; Moura et al., 2023) stating that artificial intelligence generation can stimulate inspiration. When the gaps from what originally imagined exist, more possibility awaits and creativity boosts.

The experiment is conducted to see what and how people would like to express certain emotions in the context of health through new emoji creation. Results show that face emoji are the most frequently chosen emoji from the source. In the environment category, the face vomiting emoji (🤮)is the most frequently selected element representing disgusting. Face with x eyes emoji and caution sign with an exclamation mark within (😵 and ⚠️) are considered to represent dangerous the most. Subjects tend to choose poop emoji (💩) to describe the dirty feel. Face with an open mouth, face screaming fear, and cold blue on top (😨 and 😱) are often selected to represent the scary feel. A smiley with closed eyes (😌)is often chosen to depict the cosy feel (Table 1).

Results again show that face emoji and a collection of miscellaneous items are frequently used emoji taken from the source. In the health category, the face with open eyes and hand-over-mouth emoji (🫢) is the most frequently selected element to represent pungent, whereas white eyes staring straight ahead with flushed cheeks emoji (😳) is a popular element to describe nervousness. Sponge and glowing five-point stars (🧼 and 🌟) are chosen to represent

clean the most. Caution signs with an exclamation mark within (⚠️) are often selected to represent harmful. Moreover, check mark emoji and thumbs up emoji (✅ and 👍) are often chosen to depict a safe feel (Table 2).

Table 1. New creation of emoji describing disgusting, dangerous, dirty, scary, and cosy regarding environment category.

Interjections	Disgusting	Dangerous	Dirty	Scary	Cosy
New Creation					
Frequently Used	🤮	😵 ⚠️	💩	😧 😱	😌

Table 2. New creation of emoji describing pungent, clean, nervous, harmful, and safe regarding health category.

Interjections	Pungent	Clean	Nervous	Harmful	Safe
New Creation					
Frequently Used	🤫	🧼 🌟	😳	⚠️	✅ 👍

According to the feedback from subjects, the highest demand but lacking materials to use for describing feelings and emotions in the context of health is the term "clean." The term "safe" is the second, followed by dirty and pungent. Dangerous, nervous, and harmful are the rest of the seven terms that

subjects identified. As stated by the above findings, we further invited subjects to contribute what is in their mind to depict their feelings of clean, safe, dirty, and pungent (Table 3). For example, glittering flashes of sparkles, a smiley face, a broom, and a clean window are depicted to describe the term clean. Safety helmet, smiley face with closed eyes, thumb up symbol, ring gesture symbol, two crossed hands gesture, and heart symbol are drawn to represent feeling safe. Images such as face vomiting, chewing face, and garbage bags with trash outside and curly lines are proposed to describe the dirty feel. In terms of pungent, subjects provide the dizzy face with x-shaped eyes, face with empty eyes and hand-over-mouth emoji, and nasal odor sniff drawings to describe. From a cartoon and pictogram point of view, a character with x eyes usually signifies fright, shock, embarrassment, or little hope. The free-hand drawing symbols provide certain ideas that participants would think of and use to communicate with others.

Table 3. Visualize and depict the feelings about clean, safe, dirty, and pungent provided by subjects (collected, organized, and redraw by the authors).

High Demand Terms	Freehand Ideas
Clean	
Safe	
Dirty	
Pungent	

CONCLUSION

Several studies have stated that the visual symbols and interactive elements of social media can improve the effectiveness of health information communication. As King (2015) suggested that providing the public with effective and efficient health information is vital for controlling the spread of infectious diseases. Meanwhile, the dynamic features of health information can be used to encourage users to adopt healthy behaviours and follow health instructions and can thereby reduce disease risks (King, 2015; Lin & Luo, 2023a; Zang et al., 2023). We advocate that comprehensive health communication can not only increase users' engagement level with social media but also enhance users' perceived persuasiveness. Moreover, since the widespread use of social media has accelerated emoji's popularity and taken it into a commonly used channel for public health communication (Heldman et al., 2013), these graphic symbols they have become commonplace in most people's lives and a vital component of modern communication.

Results from this preliminary study indicate that emoji as visual elements, a part of visual language, are inadequate for users to express freely online in the context of health issues. In addition, face emoji are the most frequently used emoji in general communication. Among thirteen frequently used emoji that were found in this study, The emoji caution sign with an exclamation mark within (⚠) is the one that is constantly to be interpreted as and to be thought of to present feelings of danger and harm. Also, a smiley with closed eyes (😌) is often to be interpreted as and chosen to express the cosy and safe feel. This small step allows us to understand what key visual elements to fill up to meet users' communication needs and to replenish health-related emoji for ease of use. Our previous studies have proved that emoji are highly capable of promoting more comprehensible and persuasive information communication, as well as improving reading speed. This study finds further details about how emoji play the roles as vital components of visual language in communication, to further explore how people make sense of the relationship between multiple emoji, within which to demonstrate how various arrangement of emoji affect the semantic meanings.

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