



Exploring emoji use on Twitter among students of English as a foreign language

Raghad S. Alsulaiman ¹

 0009-0005-2556-6478

Ahmad I. Alhojailan ^{2*}

 0000-0002-3553-6652

¹ Department of English, College of Science and Health Professions, King Saud bin Abdulaziz University for Health Sciences, Riyadh, SAUDI ARABIA

² Department of English Language and Literature, College of Languages and Humanities, Qassim University, Buraydah, SAUDI ARABIA

* Corresponding author: a.alhojailan@qu.edu.sa

Citation: Alsulaiman, R. S., & Alhojailan, A. I. (2024). Exploring emoji use on Twitter among students of English as a foreign language. *Online Journal of Communication and Media Technologies*, 14(3), e202441. <https://doi.org/10.30935/ojcm/14712>

ARTICLE INFO

Received: 5 Apr 2024

Accepted: 16 May 2024

ABSTRACT

This study adopted a qualitative ethnographic approach to explore the factors influencing English as a foreign language undergraduate and graduate students' emoji use in X (previously Twitter). To this end, a convenient sample of fifteen Twitter-using Saudi female undergraduate and graduate students at a Saudi University was recruited. Semi-structured interviews were used as data collection methods. The study revealed that there are some factors influencing emoji use. According to the study results, age impacts both emoji frequency and meaning. Moreover, it was found that different personas were exhibited by some participants, suggesting that they are much less reserved in English, which could influence their emoji use. Additionally, the results showed that different religious beliefs and cultural backgrounds can shape an individual's perception and interpretation of emojis. The topic of discussion and the gender of the interlocutors were also mentioned as additional factors. The study thus provided insights into a rarely investigated area of research, which is the factors influencing English as a foreign language undergraduate and graduate students' emoji use in online postings. Additionally, the study highlights the need to make an emoji function taxonomy, one that is adaptable both in versatility and applicability. Finally, the findings invite all academics to reconsider the rigidity of their anti-emoji beliefs, particularly relating to the students' expected email etiquette practices.

Keywords: emoji, EFL, writing, religion, age, Twitter, language

INTRODUCTION

The rise of the colorful pictograms known as emojis (e.g., the 😊 "face with tears of joy") has attracted the interest of many scholars in recent decades, as evidenced by a growing body of emoji literature in various fields (for a review, see Aldunate & González-Ibáñez, 2017; Bai et al., 2019). However, in both international and local contexts, the lion's share of research seems to have been in the fields of computer science and information technology (Al-Azani & El-Alfy, 2018; Shi et al. 2019). Less research has therefore been based on linguistic theories, as emojis do not seem to receive the recognition they deserve from linguists (Sia et al., 2024). Pragmatic theories are particularly suitable for investigating the factors that influence the use of emojis in online communities and therefore deserve further investigation (Li & Yang, 2018). Therefore, this research project was motivated by an educated guess: The nature of emoji use lends itself to a framework that takes advantage of Internet pragmatics.

In the context of English as a foreign language (EFL), emojis are seen as a peripheral feature of online written communication (Tandyonomanu, 2018). Despite their widespread use in online communities, there is little research on how EFL learners use the emojis available to them (Sia et al., 2024). The present study

attempted to fill this gap by examining the factors (e.g., gender, religion, age, cultural backgrounds, etc.) that might influence the pragmatic functions of emojis in the tweets of Saudi female EFL students.

This paper thus sought to answer the following research question (RQ):

RQ What are the factors affecting EFL students' emoji use in their tweets?

LITERATURE REVIEW

Social Media in Saudi Arabia

The avid use of social media among Saudis is well-documented, as a recent international report states that users in Saudi Arabia spend 42.00% of their time online browsing social media, ranking as the second most worldwide (Kemp, 2023). At the time of conducting the study, Saudi Arabia ranked as the fourth country in the world in terms of Twitter 'reach' (i.e., the number of Saudis marketers could reach on the platform) (Kemp, 2020). That statistic mirrors the results of an earlier survey by Salem (2017) who reported that Saudi Arabia has "the highest number of active Twitter users in the [Arab] region by a wide margin" (p. 44). Alshalawi (2022) reiterates this Twitter favoritism as the Saudi EFL students in his study identified Twitter as the second most social media website used for 'general purposes.'

Alshalawi (2022) also makes an interesting observation stating that, compared to the Saudi male undergraduate students in his study, the female respondents spent more time on social media networks, both for general and academic purposes. He attributes this to "culture and social differences ... [as] females generally tend to spend more time at home" (Alshalawi, 2022, p. 13). Remarkably enough, an earlier study claimed that Saudi females use social media networks less than males "due to culture and family restriction" (Milianny, 2014, p. 199). This clash of results could be a testimony to the efforts made in the kingdom to make the internet more accessible to Saudi men and women alike. A recent report by the General Authority for Statistics (2020) in Saudi Arabia assures that the 'tech gender gap' is hardly noticeable, noting only a 0.47% difference between the two genders in their social media use (97.60% for females and 98.07% for males).

English Learning in Saudi Arabia

English learning is largely present in Saudi universities. Not only is there more than one English major across multiple Saudi universities (e.g., English language, translation, English literature) but English is also taught as an elective EFL course to almost all non-English majors (Alhojailan, 2015). Furthermore, it is used as a medium of instruction for some scientific courses (including medicine and engineering) and, as in the case of King Abdullah University of Science and Technology, English is sometimes used as the only language of instruction for all courses (Alhojailan, 2015; Alrashidi & Phan, 2015). The relationship between English learning and technology thus seems to be of prominence in Saudi Arabia.

Studies have attempted to investigate Saudi EFL students' relationship with technology and, perhaps relative to the current study, social media. In his review, Alrasheedi (2019) noted that Twitter was one of the most preferred social media websites among Saudi EFL students, although it was not always for the sake of its academic affordability. Alrasheedi (2019) has reviewed several studies situated on Twitter and focused on Saudi female students. An example of these studies is the one conducted by Ali Said (2015), who used an experimental (pre-/post-test) design to study the effect of Twitter on the writing of 30 Saudi female EFL students; she found a statistically significant difference favoring the students' scores on the post-test ($X_1=9.47$, $X_2=20.00$). Alsharidi (2018) used a mixed-method design to explore 'if and how' Twitter facilitates the English learning of 25 Saudi female university students; her participants revealed that Twitter provided a positive authentic environment for English learning, one that is equal parts interactive and flexible. Similarly, after surveying 149 undergraduate Saudi female EFL students about their perceptions towards using Twitter in the classroom, Mansour and Mansour (2019) have stated that the majority of the students responding to their questionnaire had a positive attitude towards the website (63.10%).

History of Emoticons & Rise of Emojis

Since their invention, many definitions have been proposed for emoticons. They were defined as “visual cues formed from ordinary typographical symbols that when read sideways represent feelings or emotions” (Rezabek & Cochenour, 1998, p. 201), or more succinctly, they were “symbols representing emotions” (Drouin & Davis, 2009, p. 50). Emoticons thus “convey emotions through the use of graphic symbols” (Spina, 2019, p. 346). As these definitions suggest, emoticons were mostly regarded as the non-verbal equivalent of facial expressions (Crystal, 2001; Derks et al., 2008; Dresner & Herring, 2010; Rezabek & Cochenour, 1998). Emoticons were thus primarily emotive symbols made of punctuation marks, which were adapted to remedy the lack of paralinguistic cues in online interactions.

However, in the late 1990s, a new Japanese invention was created by Shigetaka Kurita (Jin, 2016). Kurita, the father of emojis, had created a more efficient version of emoticons, one that expresses more and requires fewer characters (Negishi, 2014). This new version was known as emojis and was inspired by a mixture of visual and textual elements: “weather broadcast, Chinese characters, street signs and Japanese comic art forms” (Jin, 2016, p. 54). These emojis are defined as “iconic, visual representation[s] of an idea, entity, feeling, status or event, that is used alongside or instead of words in digital messaging and social media” (Evans, 2017, p. 1). Etymologically speaking, emojis are a blend of a “picture” and emoji “character,” in the words of Danesi (2017), “a rather accurate characterization of what an emoji is” (p. 3). Giannoulis and Wilde (2019) have also defined emojis as “digital pictograms or ideograms encoded in Unicode, the standard by which computers represent text” (p. 2). This Unicod-ization of emojis described in their definition deserves a brief remark.

The addition of emojis to computers necessitated the need to standardize them, a job that was assigned to the Unicode consortium, a “membership-based organization, [which] defines the behavior and relationship among Unicode characters” (Needleman, 2000, p. 52). Thus, in the 2010s, the Unicode consortium added 722 emojis in Unicode 6.0, which brought along their arrival to Apple and Android devices shortly after (Bich-Carrière, 2019; Broekman, 2020; McCulloch, 2019). Now, the role of the Unicode consortium is one of unity and inclusivity—attempting to create a welcoming environment for internet users (Robertson et al., 2020).

Factors Influencing Emoji Uses

Emojis & gender

Some studies have found no gender-based differences in emoji use. An et al. (2018), for example, reported that gender had no significant impact on the number of emojis used by the users surveyed in their study (21 females and 10 males). Similarly, Jaeger et al. (2018) found a gender difference neither in the participants’ emoji interpretation nor in their frequency of use (n=1,084, 51.00% females). However, the majority of emoji research seems to highlight gender differences both in emoji frequencies and functions. In her study of Arabic-speaking students, Al Rashdi (2015) noted that females used emojis way more than their male peers, evident in the number of emojis collected over three months for female WhatsApp groups (n=1,126) in comparison with the number of emojis found in the male groups over nine months (n=430). Furthermore, some emojis were chiefly used by one gender and not the other (e.g., the 👎 “thumbs down” emoji was exclusively used by males, whereas the 👍 “thumbs up” emoji was primarily used by females) (Al Rashdi, 2015). Algharabali and Taqi (2018) also described some interesting gender-based differences in their sample (81 females and 82 males): Female participants were motivated to use emojis because they clarify the meaning of their messages while male participants justified that emojis are simply fun to use. Additionally, when messaging the opposite gender, a number of interviewees refrained from using emojis as they “might be misunderstood ... due to gender differences in interpretation” (Algharabali & Taqi, 2018, p. 51).

Several other universal studies identify gender as an influencing factor in relation to emoji use, frequency, and functions. Chen et al. (2018), for instance, found that females (53.00%) use emojis more frequently than males (47.00%), in general; and, on public platforms (such as Twitter), in particular. Both Jones et al. (2020) (163 females and 136 males) and Prada et al. (2018) (344 females and 130 males) also observed that women’s actual and reported emoji use exceeded that of men. This is further reflected in Swan’s (2019) sample (76 females and 22 males) as the women tended to use emojis more frequently than the men even though the number (and functions) of emojis found in a single message by either was comparable. Contrarywise, Persson (2019) has found that the functions of emojis were gendered as the females in his study (n=15) used emojis

to express how they feel more than the males (n=15) while, in turn, the males used emojis to emphasize what they mean more. Similarly, López-Rúa (2021) found that females (n=80) used emojis more than males (n=80) and that the male users used emojis mostly to express amusement, whereas the female users used them to express love. Koch et al. (2020) have also found that in their sample (143 females and 56 males), women used emojis more often, and to a broader range, than men.

All the same, Danesi (2017) emphasized that the pragmatic functions of emojis are 'de-gendered' and as such, studies that suggest otherwise should be reviewed within their specific contexts. Given the asymmetry of the gender distribution found in most of these studies, we are inclined to agree with Danesi (2017): Gender, as an independent variable impacting emoji use, should be examined more carefully to not perpetuate negative stereotypes. One emoji use variable that is less controversial than gender is age, which will be reviewed next.

Emoji & age

The relationship between age and emoji use has been an attractive area of research, understandably so, given how emojis are used in online spaces with younger users as their primary residents. However, that does not make the literature on the matter any more conclusive. That is because different researchers set different thresholds of what qualifies as 'young' and 'old.' Nevertheless, for the purpose of transparency, we will report any information about the age of the participants provided by the researchers, much like the information on gender distribution included in the previous section.

To start with, fewer studies have indicated that age does not influence emoji use; for example, the interpretation of emojis was not significantly different across the three age groups (18-30, 31-45, and 46-60 years old) in a study by Jaeger et al. (2018). However, more studies suggested that younger generations use emojis more frequently, more creatively, and less literally than older generations. Gallud et al. (2018), for example, found that older participants (age 37 and above) used fewer emojis than younger participants (age 35 and below). An et al. (2018) also observed that elder participants (age 51 and above) used the least number of emojis while youth participants (age 16-25 years old) used the most. Further, the functions of emojis varied across ages as the same emoji (i.e., the 😊 "slightly smiling face" emoji) that was utilized by those above 25 to express sincerity, was used by those under 25 to express irony (An et al., 2018). In a similar vein, Al-Jahdali (2023a) analyzed twenty Saudi mother-daughter WhatsApp groups' chat interactions, where she found that the mothers (40 years and above) use emojis more literally than their daughters (15-25 years old). For instance, the ⌚ "hourglass" emoji was used by the mothers to represent time, yet it represented an hourglass-shaped body to the daughters (Al-Jahdali, 2023a).

This 'emoji gap' led the daughters to adopt their mothers' style of emoji use, such as using the 😊 "smiling face with hearts" emoji to resemble their mothers' excessive use of the 😘 "face blowing a kiss" emoji (Al-Jahdali, 2023a). Escoufflaire (2020) similarly mentioned that if a message contained one emoji, her participants thought the sender was 15-30 years old, but if the same message contained more than three emojis, they thought the sender was over 40 pretending to be a teenager. This assumed generational gap is also found in the users' perceptions of emojis; as Kazmi et al. (2019) have found that their younger participants (age 18-25 years old) perceived emojis to be accommodating and effective, whereas 'aged' ones (age 45 and above) thought emojis to be confusing and harmful to language. This relationship between emojis and language has elicited much debate (for a review, see Alshenqeti, 2016), and will be briefly discussed next along with culture, since the two are interlaced.

Emoji, language, & culture

Emojis have been described as being "culturally-biased" (Yus, 2019, p. 21). As was previously mentioned, even in earlier emoticon days, a cultural-based difference was found in western horizontal emoticons (e.g., :\$) and eastern vertical kaomoji (e.g., ^_^) (Giannoulis & Wilde, 2019; McCulloch, 2019; Michael & Ruane, 2000; Park et al., 2013). Parenthetically, in their study of 10 million users, Park et al. (2013) suggested that the difference in emoticon use seems to be linguistically motivated. Users in the Philippines and Indonesia (where English is a common language) tended to use horizontal emoticons much like Westerners (Park et al., 2013). In a later study, Park and El Mimouni (2020) found that in 280 cases of emoticon use on Twitter, English tweets included the greatest number of emoticons while Arabic and Korean tweets included an equal, but lesser,

number. This seems to reflect the nature of collectivist Asian societies and individualistic Western societies, an observation that was also made by Lu et al. (2016). Having analyzed 427 million instant messages from 212 countries, Lu et al. (2016) reported that users from individualistic societies (such as Australia or France) were simultaneously more likely to use emojis to express positive emotions and less likely to use emojis to express negative emotions than users from collectivist societies (like Iraq or Mexico). Interestingly enough, they found that users from France used heart-related emojis the most, a finding that was contradicted in Escoufflaire's (2020) study as she stated that out of 1200 emojis, those found in English tweets functioned mostly as expressive while those found in French tweets functioned as interpretive. She attributes this inconsistency to the fact that her study "compares languages, while the other study focused on countries" (p. 98).

Another language-oriented survey is that by Barbieri et al. (2016) who conducted an experimental study including 30 million tweets written in Italian, Peninsular Spanish, US English, and British English. Although the most common emojis were the same across the four languages (e.g., the 😊 "face with tears of joy," the ❤️ "red heart," and the 😍 "smiling face with heart-eyes" emojis), some cross-lingual differences were found. One interesting difference was the use of the 🙋 "waving hand" emoji; it was associated in US English with farewells (e.g., the 👋 "woman raising hand" emoji) but with travel-related emojis in British English (e.g., the ✈️ "airplane" emoji). Using a quantitative design, Kejriwal et al. (2021) similarly investigated the relationship between emoji use, language, and country on Twitter. Kejriwal et al. (2021) report that the 😊 "face with tears of joy" emoji was common worldwide, yet the ❤️ "red heart" emoji was more common in the Middle East than in the West. A larger-scale survey on emojis was the SwiftKey project, which has also shown some language-specific emoji frequencies. For instance, "Anglo-American societies generally showed a high degree of usage of money, sports, violence-based, and raunchy emoji" while "Arabic speakers used the rose emoji ten times more than other language speakers" (Danesi, 2017, p. 121). Yet, it is hard to deny that these linguistic differences are not, at least partly, cultural. Americans' high use of money emojis could very well reflect consumerism, capitalism, 'hustle culture' and other topics that are often featured in American online spaces. This cements just how interwoven language and culture, within a society, are and invites us to consider other societal factors. We shed light on two of these factors, namely context and religion, next.

Emoji & context

Generally speaking, emojis are more common in private rather than public interactions (Chen et al., 2018). The topic of these interactions also plays a role, as Escoufflaire (2020) has found that users included more relational emojis when discussing everyday life topics, more expressive emojis when chatting about entertainment, and less expressive emojis when debating politics. Investigating the British use of emojis on Twitter, López-Rúa (2021) found comparable results; emojis were used more with less serious topics (e.g., with entertainment more than politics). Levi et al. (2024) observed a surge of specific emojis associated with certain topics and trends on Twitter. For instance, the 🧑‍⚕️ "face with medical mask" emoji emerged following the COVID-19 pandemic. As for contextualized emojis, Danesi (2017) reported an almost paradoxical behavior of his informants: While they preferred using emojis when discussing serious and heavy topics in informal conversations, they avoided using any emojis in formal conversations regardless of the topics discussed. These informants were most likely influenced by the academic discourse around the informality of emojis, as clearly put by one of Danesi's (2017) participants who stated that "essays are too serious for emojis to be used" (p. 25). This informal perception carries out an interpersonal function in which emojis point to the relationships between the interlocutors (Saad et al., 2018; Shi et al., 2019). In fact, Al Rashdi (2015) considered emojis to have an interpersonal function, such as the 😜 "winking face" emoji, which was used by her participants to signal intimacy and closeness.

Emoji & religion

In one of the first (and seemingly only) studies of Emojis and Islam, Stanton (2018) presented an essay on the use of 'Islamic' emoticons and the Islamic debate around emoticon use. Having scouted out Muslim online forums, she observed that the users in these forums used halal [permissible] emoticons (e.g., بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ) to represent their identity. She also discussed the permissibility of emoticons in Islam; in one fatwa [Islamic Ruling] Stanton (2018) referenced, a Muslim scholar ruled that emoticons are not prohibited because they are inanimate objects that do not fall under the forbidden creation of images that match the

Table 1. Some biographical data of study participants

Pseudonym	Age group	Level	Degree	Major
1. Dania	B (23-27)	2	MA	Applied linguistics
2. Rana	B (23-27)	2	MA	Applied linguistics
3. Fajir	B (23-27)	2	MA	Theoretical linguistics
4. Entesar	B (23-27)	4	MA	Applied linguistics
5. Inas	B (23-27)	4	MA	Applied linguistics
6. Shahad	B (23-27)	4	MA	Applied linguistics
7. Layal	C (28-32)	6	MA	Applied linguistics
8. Ghaida	B (23-27)	6	MA	Theoretical linguistics
9. Wijdan	C (28-32)	6	MA	Theoretical linguistics
10. Amal	B (23-27)	7	BA	English language & translation
11. Mariah	A (18-22)	7	BA	English language & translation
12. Zenah	A (18-22)	7	BA	English language & translation
13. Narin	B (23-27)	8	BA	English language & translation
14. Hana	B (23-27)	8	BA	English language & translation
15. Rand	B (23-27)	8	BA	English language & translation

creation of Allah (SWT). This scholar focused more; however, on how Muslim women should refrain from using emoticons when interacting with the opposite gender of non-mahram [unrelated] Muslim men.

In another paper by Al-Jahdali (2023b), who observed Saudi female-only WhatsApp groups, she described a ‘religion-related’ WhatsApp groups, where “they read, memorize, and recite Quranic verses to each other and share religious news and updates” (p. 98). Such groups enacted distinct functions using emojis, such as using the ❤️ “yellow heart” and 🙏 “folded hands” for Islamic greetings, wishes, and prayers. Systemically speaking, the Unicode Consortium has approved a few Islamic emojis, such as the 🕌 “mosque” emoji and the 🕌 “prayer bead” emoji. However, one particular emoji that has had considerable press coverage, perhaps due to its interesting conception, is the 🧕 “woman with headscarf” emoji. Rayouf Alhmedhi, a 15-year-old Saudi student, proposed the idea of the emoji because she wanted more representation of “the millions of women who wear the headscarf every day, and pride themselves on wearing the headscarf” (Ohlheiser, 2016, para. 3). Her proposal was approved in 2017 and this emoji is now used by hijabi [head-scarfed] Muslim women all around the world.

METHODOLOGY

Qualitative Ethnography: A Rationale

A qualitative ethnographic design was used to explore the factors affecting EFL undergraduate and graduate students’ emoji use. Such a design was deemed the most appropriate because the purpose of the study was to describe, explore, and interpret these students’ emoji beliefs and behaviors (Bloomberg & Volpe, 2018; Creswell, 2014; Kothari, 2004; Mackey & Gass, 2016; Mills & Gay, 2016). The characteristics of this research project are thus in line with such a design. For one, the research adopted “an interpretive naturalistic approach to the world” (Bloomberg & Volpe, 2018, p. 98). Furthermore, it focused on “the perspective of the research participants” (Bloomberg & Volpe, 2018, p. 98). By surveying the perceptions of how participants use emojis in their interactions, the main focus of this research was directed at the participants and their experiences.

Participants

The target population of this study was Twitter-using Saudi female undergraduate and graduate students majoring in English at a Saudi university. **Table 1** provides some biographical data of the study participants. The reason for limiting the study to students majoring in English was to ensure that these students have familiarized themselves with the target language (and culture). It is worth noting that the sample included only older students (those enrolled in the last year of their BA program) to ensure that their English proficiency was comparable to that of graduate students. In addition, the population was restricted to female EFL students as the literature reports the frequent use of emojis among females (Al Rashdi, 2015; Chen et al, 2018; Jones et al, 2020; Koch et al, 2020, Prada et al, 2018), the importance placed on presenting online identities for Saudi women (Alsaggaf, 2015; Altoaimy, 2018; Al-Yousef, 2021; Mustafa, 2017), and the segregated nature

of Saudi universities. Finally, limiting the population to Twitter-using students was motivated by the advantageous nature of Twitter as an analytical platform, but also by Saudi students' longstanding preference for Twitter as noted by Saudi researchers (Alrasheedi, 2019; Alshalawi, 2022; Alsharidi, 2018).

From that study population, a convenience sampling technique was used in recruiting the study participants. Described as a non-probability sampling method, convenience sampling techniques are used to ensure ease of access to the study population (Kumar, 2011). An obvious advantage of this method is that it frees the researcher from any limitation posed on the number or the nature of the sample (Cohen et al., 2017; Kumar, 2011).

Despite that, convenience sampling is disadvantageous as it does not guarantee a representative generalizable sample (Kumar, 2011). However, since the current study is exploratory, there is no effort made to generalize the results to a wider population. Providing thick and rich descriptions of the study sample is thus prioritized, which also explains the relatively small sample size (n=15).

Data Collection

In this study, semi-structured interviews were employed. Bloomberg and Volpe (2018) stated that in qualitative studies, interviews are "often selected as the primary method for data collection" (p. 317). Given the type of interview used, namely semi-structured interviews, this flexibility is further enhanced as interviewers can adjust, digress, and follow up as the interview progresses (Mackey & Gass, 2016). Semi-structured interviews also offer a closer look at a phenomenon as they resemble the flow of everyday conversation (Bloomberg & Volpe, 2018).

In this study, the interviews were conducted online through Zoom. Conducting interviews online, using video conferencing apps, is more common than ever given the recent COVID-19 pandemic hit. Zoom, in particular, has been described as a favorable online interviewing tool for researchers and participants alike (Archibald et al., 2019). It features many essential functions, such as the screen-recording feature, which we utilized to record the interviews, and the chat-log function, which helped in keeping track of the examples of emoji uses the interviewees typed during the interview.

When conducting the interviews, we followed the guidelines suggested by Mills and Gay (2016) who stated that for an interview to be productive, researchers should consider the following:

- Listen more; talk less. Listening is the most important part of interviewing.
- Do not interrupt. Learn how to wait.
- Tolerate silence. It means the participant is thinking.
- Avoid leading questions; ask open-ended questions.
- Keep participants focused and ask for concrete details.
- Follow up on what participants say and ask questions when you do not understand.
- Do not be judgmental about participants' views or beliefs; keep a neutral demeanor. Your purpose is to learn about others' perspectives, whether you agree with them or not.
- Do not debate with participants over their responses. You are a recorder, not a debater (p. 569)

The interviews were conducted in colloquial Arabic, the native language of the participants, which often evoked colorful local expressions as the quoted transcripts will show.

FINDINGS

The present study sought to investigate the factors affecting Saudi female EFL undergraduate and graduate students' emoji use in their Tweets. After interviewing 15 participants, it was found that some factors could be affecting their choices of emojis. To begin with, given the study participants and context, we were adamant to explore at least two factors influencing emoji use: Age and language. However, more factors have come to the surface as we were interviewing the participants. Thus, six main factors emerged as an answer to the research question: "What are the factors affecting EFL students' emoji use?" as will be demonstrated shortly.

Age

When asked whether they think age could influence their emoji use, all participants agreed that age does have a role to play. One-fifth of them; however, expressed that this influence is more generational than individual, as they did not notice a change in their emoji use over time.

Layal, for example, explained that (excerpt 1):

“Honestly, I went back to the time of Messenger and forums and the icons I use have not changed” (Layal, interview transcript, p. 5).

Nevertheless, participants emphasized that age impacts both emoji frequency and meaning. On the one hand, some indicated that emoji frequency increases with age (excerpt 2 & excerpt 3, respectively):

“Of course [age] has an impact ... the older I get, the less [emojis] I use, I do not know what’s the connection” (Shahad, interview transcript, p. 6).

“The more emoji [used], the younger the age, and the less emoji [used], the older the age” (Ghaida, interview transcript, p. 11).

On the other hand, other participants demonstrated how the meaning of some emojis changes across generations. Fajir gave an example of how the same emoji is used to express contradicting senses for two generations (excerpt 4):

“The kissing face with a heart [🥰] ... mothers use it to compliment someone, whereas we could use it to insult someone” (Fajir, interview transcript, p. 10).

On her part, Entesar explained that the same function is appropriately expressed by a different emoji for each generation (excerpt 5):

“Even on Tiktok now, [users] say if you use this face [😂] to laugh, you are in the twenties, but if you use the ‘you’re dead’ one [💀], you are a teenager” (Entesar, interview transcript, p. 11).

Amal agreed with Entesar (excerpt 6):

“Sometimes in Twitter, you can tell the person’s age just by the emojis they use, I mean teens have their own emojis, the youth have their own emojis, seniors have their own emojis” (Amal, interview transcript, p. 10).

Language

Unlike age, the influence of language on emoji use was controversial. As a prelude to the relationship between emoji and language, we asked the participants first about their ‘internet persona’ and whether their online writing is influenced by the language they use (i.e., Arabic versus English). Only two-thirds of the participants expressed that they may exhibit different personas, suggesting that they are much less reserved in English (excerpt 7):

“In Arabic, I feel like I am a little more formal ... but in English, no, I can say what I want, so like I do not worry about whether or not someone will misunderstand me” (Narin, interview transcript, p. 12).

Entesar clarified why that is the case (excerpt 8):

“I feel more comfortable writing in English, or venting, or if something’s bothering me, or if there’s something to get off my chest, I will post a tweet in English, because no matter what, there’s a large segment of society that does not speak English, it is not their mother tongue, so if they see that tweet, they will immediately skip it” (Entesar, interview transcript, p. 12).

The remaining one-third suggested that even if their personas did change, that would not be reflected in their online writing. Such as Shahad, who stressed that (excerpt 9):

“When I speak in Arabic, it is not the same personality as when I speak in English, but in writing ... I do not think there’s a difference” (Shahad, interview transcript, p. 6).

And Layal, who was less certain (excerpt 10):

“My ideas are half-baked still when it comes to this ... personally, I do not think I am different” (Layal, interview transcript, p. 5).

Accordingly, when it came to emoji use, less than half of the participants (n=6) perceived a difference in how they use emojis in Arabic and English. These participants; however, were of like mind about how their emoji use decreases in English. Fajir linked this decline to her nativity in Arabic (excerpt 11):

“My [emoji] use in English is generally less than that in Arabic ... maybe because it’s my native language” (Fajir, interview transcript, p. 11).

On her part, Dania associated it with the interlocutors (excerpt 12):

“I feel like in English, I use less emoji[s] ... maybe because I often talk to my teachers, so I feel embarrassed to add a bunch of emojis” (Dania, interview transcript, p. 7).

Lastly, Inas differentiated between communication and interaction, emphasizing that only the latter requires emoji use (excerpt 13):

“All my communication in English is for academic purposes ... so I do not use [emojis] in English, but in Arabic I use them a lot because I interact with everyone informally, because my interaction with my friends is mostly in Arabic ... because interaction needs emojis” (Inas, interview transcript, p. 12).

Context

The context was often brought up as an influencing factor in emoji use. In fact, almost half the participants (n=7) have mentioned context when discussing other factors, such as language (excerpt 14):

“I use English in formal speech, so I use emojis ... like I said, a rose or a heart” (Amal, interview transcript, p. 12).

Narin further illustrates this informality of emojis in academic settings (excerpt 15):

“Some doctors expect the interaction between you two to be formal, without I mean, if you want to send me an email or something, send me something formal, do not add emojis and all that fuss, but some of them do not mind, she likes this stuff, and treats us with leniency” (Narin, interview transcript, p. 9).

In addition to the three factors discussed earlier, three more factors were unpromptedly mentioned by a few participants, namely gender, culture, and religion.

Gender

Out of 15, only two participants mentioned gender. One of whom was Wijdan, who said (excerpt 16):

“Compared to my sisters ... all my conversations with my brothers have no emojis ... maybe because girls are sensitive or I use emojis when talking to them” (Wijdan, interview transcript, p. 9).

Another one was Rana, who stated that (excerpt 17):

“I think even gender makes a difference like in the use of emojis ... some emojis I feel like are not used by men, or males, a lot” (Rana, interview transcript, p. 10).

Culture

Mariah mentioned culture as an influencing factor stating that (excerpt 18):

"I remember we talked about emoji[s] with a Pakistani teacher, and she was saying that your use is different than ours" (Mariah, interview transcript, p. 7).

Similarly, Rand expressed her caution towards using emojis with those who do not share her culture, explaining that (excerpt 19):

"Honestly I only use emojis with my Saudi doctors ... because like I am worried of being misunderstood, you know, what if they have a different meaning" (Rand, interview transcript, p. 4).

Conversely, Layal expressed the universality of certain 'viral' emojis, stating that (excerpt 20):

"The laughing face emoji [😂] ... like I said, it has become understood everywhere. I mean whether one is Indian, American, or Russian, a laughing face emoji expresses laughter" (Layal, interview transcript, p. 7).

Religion

Only a couple of participants mentioned religion, including Dania, who explained that (excerpt 21):

"The Girls Academy [for Memorizing the Holy Quran] group ... do not use many emojis ... I do not know if there is an Islamic ruling to be honest because mashAllah most of them are religious, so I do not know, if I knew I would not use [emojis] because they're forbidden or something" (Dania, interview transcript, p. 7).

Amal mentions an association between trees (as non-facial emojis) and religion, stating that (excerpt 22):

"Sometimes I use trees and such if ... if I am talking about a religious topic but I do not know why" (Amal, interview transcript, p. 4).

DISCUSSION

In relation to the factors influencing emoji use, age was the most prevalent. To begin with, the participants in this study believe that age correlates negatively with emoji frequency. This finding mirrors previous studies, such as An et al. (2018) and Gallud et al. (2018) in which older participants were reported to use fewer emojis than younger participants. The participants also point to what Al-Jahdali (2023a) calls an 'emoji gap' in which the age group of participants influenced their emojis' interpretations and functions. Although this finding does not support that of Jaeger et al. (2018), it corroborates the findings of a great deal of the previous work on emoji functions. More specifically, as expressed by this study's participants, older generations interpret and use emojis more literally and rigidly than younger generations (Al-Jahdali, 2023a; An et al., 2018). Another finding in agreement with previous literature is the assumed generational gap in which certain emojis are strongly associated with an age group (e.g., the 😘 "face blowing a kiss" as a 'mom emoji') (Al-Jahdali, 2023a; Escoufflaire, 2020; Kazmi et al., 2019). Once again, the generational use of emojis is not surprising as this 'divide' has always emerged with every innovative use of language in communication (Alshenqeeti, 2016; Danesi, 2017).

As a factor impacting emoji use, language was less prominent. Some participants in this study reported using fewer emojis in English in comparison with Arabic, a finding that directly contradicts that of Park and El Mimouni (2020) who found English tweets to contain more emoticons than Arabic ones. However, this is not completely unseemly since their study compared English and Arabic native speakers, whereas the current study included native speakers of Arabic with English as their second language. This homogeneity also explains why the study has been unable to demonstrate the cross-linguistic difference in the use of emojis reported in earlier research (Barbieri et al., 2016; Kejriwal et al., 2021; Lu et al., 2016). Interestingly enough, a few participants did reference the cultural-biasedness of emojis (Yus, 2019), citing a possible difference in the

use of emojis across diverse cultures (Danesi, 2017; Escoufflaire, 2020; Giannoulis & Wilde, 2019; McCulloch, 2019; Michael & Ruane, 2000; Park et al., 2013). However, the small scale of the study coupled with the mono-cultural nature of participants begs for more research to be done to establish such language-culture and emoji-use connections.

Another possible explanation for the perceived prolific use of emojis in Arabic might be the context of the online postings, rather than their language. In other words, some participants stated that they use fewer emojis in English because their English interactions are mostly academic, especially with their instructors. To them, emojis are primarily used in informal and unserious contexts, a statement in line with earlier studies in which emojis are used in online discussions around topics less serious in nature (Danesi, 2017; Escoufflaire, 2020; López-Rúa, 2021). More importantly, the participants felt as though emojis should not be used in professional settings as they might signal a certain intimacy inappropriate for the context (Danesi, 2017; Saad et al., 2018; Shi et al., 2019). Interlocutors thus seem to play a huge role in the emoji use (or lack thereof) in online communications.

In the same vein, one participant mentioned that the gender of her interlocutors played a role in the emojis she used. Not only is this in accord with the perceptions of Algharabali and Taqi's (2018) participants, but it also pays respect to the ideas discussed in Stanton's (2018) paper about females' use of emojis when interacting with males. One more aspect of Stanton's (2018) paper that was also shadowed in this study's participants' comments was the permissibility of emojis in Islam, as one participant mentioned that some of her acquaintances in religious groups refrained from using emojis fearing that they might be prohibited. Remarkably enough, the nature of this religious group was described in Al-Jahdali's (2023b) paper, where emojis (mostly non-facials) were used in their interactions to accompany Islamic sentiments. A third participant also stressed the gendered nature of emojis, a statement that supports a line of research, wherein males were reported to use emojis way less than females (Al Rashdi, 2015; Chen et al., 2018; Jones et al., 2020; Koch et al., 2020; Prada et al., 2018) and express amusement rather than emotions in their emoji use (Algharabali & Taqi, 2018; López-Rúa, 2021). It is encouraging to compare such findings, although the limited nature of the data in this study should not be ignored.

CONCLUSIONS

The current study attempted to explore the factors affecting Saudi female EFL undergraduate and graduate students' emoji use in their tweets. Having conducted interviews with 15 graduate and undergraduate participants, it was found that there are several factors affecting their use of emojis. Participants emphasized that age influences both emoji frequency and meaning. Younger generations tend to use emojis more frequently and creatively, leading to a real and perceived 'emoji gap.' Furthermore, the majority of interviewees stated that they may adopt different online identities, implying that they are far less reserved in English. Thus, the context of their online interactions, rather than the language, could explain the scarcity of their emoji use in English. Participants also noted that diverse religious views and cultural backgrounds can influence an individual's perception and understanding of emojis. Gender was an additional, though less important, consideration as women are perceived to use emojis more than men.

Implications







With these findings in mind, this research offers some contributions to the current literature. Since the Saudi emoji literature is scarce, the findings could be used as a steppingstone to exploring more pragmatic functions of emojis in Saudis' online writing. Namely, this research sheds light on the commonness of emoji functions as the classification identified in this study complements that of earlier studies. Yet the findings also elucidate the uniqueness of emoji use, whether this manifested in the role of emojis in representing the students' individual identity or in the great variability in their emoji frequency. Furthermore, the study has raised some interesting questions about the nature of the emoji-language relationship; although more studies need to be carried out to examine such a relationship more closely.

Despite not being practically motivated, a few practical implications could be drafted from this research. At the outset, there needs to be an emoji function taxonomy, one that is adaptable both in versatility and applicability. This will not only help in making emoji functions more identifiable as the same function had

different, sometimes irrelevant, names in the literature, but it will also make these functions more easily operationalizable for future quantitative research. One other pedagogical implication relates to the tension between emojis and academic writing. Participants continuously expressed that emojis are not welcomed in formal contexts, yet studies have shown that emojis can be utilized in the classroom, especially in EFL classes. This is not a call to action to force emojis into academic essays or journal articles, but one that invites all academics to reconsider the rigidity of their anti-emoji beliefs, particularly relating to the students' expected email etiquette practices.

Recommendations

As is custom, future studies could make use of the shortcomings of this study. Since this study prioritized the homogeneity of the research participants, variations in culture, gender, and age were left unexamined. The literature would thus be enriched by cross-culture studies in which Saudi students' emoji use is compared to that of American students, for example, as the contrast between Eastern and Western emoji use is well-established. Similarly, comparative cross-gender studies on the factors affecting emoji use by both female and male Saudi students would be quite interesting. As would studies that focus on Saudi teenagers, comparing and contrasting their emoji use with that of older generations. Alternatively, situating the study on more private social media platforms (such as WhatsApp) is expected to yield more complex functions, particularly in relation to signaling familiarity and intimacy.

Putting that aside, working with other emoji-like icons could be fruitful. For instance, Apple's Animoji (i.e., animated emoji) feature combines visual, audio, and video elements and could therefore perform more nuanced functions. Similarly, the graph icons identified by my research participants as the 'future' of emojis (namely stickers, GIFs, and memes) have been analyzed alongside emojis and deserve further recognition. Even emojis themselves continue to evolve with every new Unicode consortium release; the Emoji 14.0 version, for example, brought about many discussions that future studies may be concerned with. Notably, the decision to include a  "pregnant man" emoji was quite controversial, as many conservatives believed it to be an extension of the language-gender debate and a showcase of liberals' definition of 'womanhood.' The  "hamsa" emoji (i.e., an amulet of good omen often associated with Islamic traditions) similarly stirred up conversations about the language of social media and its role in appropriating Bid'ahs [heterodox doctrines]. On Twitter, discussions surrounding the  "watermelon" emoji and its association with the infada [resistance movement] could be usefully explored in further research, especially under critical discourse analysis. On a lighter note, future studies could also investigate the 'death' of the  "face with tears of joy" emoji and how it is now replaced (as my participants expressed) by the  "loudly crying face" emoji or the 'I'm dead'  "skull" emoji.

Limitations

The study is limited by the homogeneity of the research participants and the scarcity of topics. Future studies are therefore encouraged to conduct larger-scale studies with diverse participants from different cultures, genders, and age groups, and across varying contexts and languages. Additionally, the current study did not investigate the effect of some psychological factors, such as extroverts' and introverts' frequent use of emojis in their tweets. Nevertheless, the study provided in-depth insights into a rarely studied field of research, namely the factors influencing EFL undergraduate and graduate students' emoji use in online communication.

Author contributions: **RSA:** conceptualization, methodology, writing—original draft preparation, & investigation & **AIA:** visualization, investigation, supervision, project administration, writing—review & editing, & funding acquisition. Both authors approved the final version of the article.

Funding: The Researchers would like to thank the Deanship of Graduate Studies and Scientific Research at Qassim University for financial support (QU-APC-2024-9/1).

Ethics declaration: The authors declared that all research procedures were carried out in compliance with guidelines for ethical research, and measures were taken to ensure anonymity & privacy of the participants. This study was approved by Qassim University (DELT-422-17-6). Written informed consents were obtained from the participants.

Declaration of interest: The authors declare no competing interest.

Data availability: Data generated or analyzed during this study are available from the authors on request.

REFERENCES

- Al Rashdi, F. (2015). *Forms and functions of emojis in WhatsApp interaction among Omanis* [Doctoral dissertation, Georgetown University].
- Al-Azani, S., & El-Alfy, E. M. (2018). Emoji-based sentiment analysis of Arabic microblogs using machine learning. In *Proceedings of the 21st Saudi Computer Society National Computer Conference* (pp. 1-6). <https://doi.org/10.1109/NCG.2018.8592970>
- Aldunate, N., & González-Ibáñez, R. (2017). An integrated review of emoticons in computer-mediated communication. *Frontiers in Psychology*, 7. <https://doi.org/10.3389/fpsyg.2016.02061>
- Algharabali, N. A., & Taqi, H. A. (2018). Taming the sting: The use of evaluative emojis by college students in Kuwait. *International Journal of Linguistics and Communication*, 6(1), 46-60. <https://doi.org/10.15640/ijlc.v6n1a4>
- Alhojailan, A. (2015). *Perceptions of academic writing by some Saudi graduate students studying in American universities* [Doctoral dissertation, Oklahoma State University].
- Ali Said, M. A. E. (2015). The effect of Twitter on developing writing skill in English. *Arab World English Journal*, 2, 134-149. <https://doi.org/10.2139/ssrn.2843985>
- Al-Jahdali, N. A. M. (2023a). Are you emojiically a mom? Age, social role, and emojis in Saudi mother-daughter WhatsApp groups. *International Journal of Linguistics, Literature and Translation*, 6(9), 13-29. <https://doi.org/10.32996/ijlt.2023.6.9.2>
- Al-Jahdali, N. A. M. (2023b). Emojis on board: The communicative functions of emojis in Saudi females' WhatsApp groups' interactions. *International Journal of Linguistics, Literature and Translation*, 6(6), 88-104. <https://doi.org/10.32996/ijlt.2023.6.6.10>
- Alrasheedi, S. (2019). The effect of social media networking use in EFL classrooms in Saudi Arabia: An argumentative review. *International Journal of English Linguistics*, 10(1), 241-254. <https://doi.org/10.5539/ijel.v10n1p241>
- Alrashidi, O., & Phan, H. (2015). Education context and English teaching and learning in the Kingdom of Saudi Arabia: An overview. *English Language Teaching*, 8(5), 33-44. <https://doi.org/10.5539/elt.v8n5p33>
- Alsaggaf, R. (2015). *Identity construction and social capital: A qualitative study of the use of Facebook by Saudi women* [Doctoral dissertation, University of Leicester].
- Alshalawi, A. S. (2022). Social media usage intensity and academic performance among undergraduate students in Saudi Arabia. *Contemporary Educational Technology*, 14(2), ep361. <https://doi.org/10.30935/cedtech/11711>
- Alsharidi, N. K. M. (2018). The use of Twitter amongst female Saudi EFL learners. *International Journal of Applied Linguistics and English Literature*, 7(4), 198-205. <https://doi.org/10.7575/aiac.ijalel.v.7n.4p.198>
- Alshenqeti, H. (2016). Are emojis creating a new or old visual language for new generations? A socio-semiotic study. *Advances in Language and Literary Studies*, 7(6), 56-67. <https://doi.org/10.7575/aiac.all.v.7n.6p.56>
- Altoaimy, L. (2018). Driving change on Twitter: A corpus-assisted discourse analysis of the Twitter debates on the Saudi ban on women driving. *Social Sciences*, 7(5), 81. <https://doi.org/10.3390/socsci7050081>
- Al-Yousef, M. (2021). *The role of higher education in developing female students' social and cultural identities: A case study of one university in Saudi Arabia* [Doctoral dissertation, University of Roehampton].
- An, J., Li, T., Teng, Y., & Zhang, P. (2018). Factors influencing emoji usage in smartphone mediated communications. In G. Chowdhury, J. McLeod, V. Gillet, & P. Willett (Eds.), *Lecture notes in computer science* (pp. 423-428). Springer. https://doi.org/10.1007/978-3-319-78105-1_46
- Archibald, M. M., Ambagtsheer, R. C., Casey, M. G., & Lawless, M. (2019). Using Zoom videoconferencing for qualitative data collection: Perceptions and experiences of researchers and participants. *International Journal of Qualitative Methods*, 18. <https://doi.org/10.1177/1609406919874596>
- Bai, Q., Dan, Q., Mu, Z., & Yang, M. (2019). A systematic review of emoji: Current research and future perspectives. *Frontiers in Psychology*, 10. <https://doi.org/10.3389/fpsyg.2019.02221>
- Barbieri, F., Kruszewski, G., Ronzano, F., & Saggion, H. (2016). How cosmopolitan are emojis? Exploring emojis usage and meaning over different languages with distributional semantics. In *Proceedings of the 2016 ACM Multimedia Conference* (pp. 531-535). ACM. <https://doi.org/10.1145/2964284.2967278>

- Bich-Carrière, L. (2019). Say it with [a smiling face with smiling eyes]: Judicial use and legal challenges with emoji interpretation in Canada. *International Journal for the Semiotics of Law*, 32(2), 283-319. <https://doi.org/10.1007/s11196-018-9594-5>
- Bloomberg, L. D., & Volpe, M. (2018). *Completing your qualitative dissertation: A road map from beginning to end*. SAGE.
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, 11(4), 589-597. <https://doi.org/10.1080/2159676X.2019.1628806>
- Braun, V., & Clarke, V. (2021). *Thematic analysis: A practical guide*. SAGE. https://doi.org/10.1007/978-3-319-69909-7_3470-2
- Broekman, J. M. (2020). Like your emoji—A philosophical context. *Social Semiotics*, 30(3), 415-429. <https://doi.org/10.1080/10350330.2020.1731991>
- Chen, Z., Lu, X., Ai, W., Li, H., Mei, Q., & Liu, X. (2018). Through a gender lens: Learning usage patterns of emojis from large-scale Android users. In *Proceedings of the 2018 World Wide Web Conference* (pp. 763-772). <https://doi.org/10.1145/3178876.3186157>
- Cohen, L., Manion, L., & Morrison, K. (2017). *Research methods in education*. Routledge. <https://doi.org/10.4324/9781315456539>
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches*. SAGE.
- Crystal, D. (2001). *Language and the Internet*. Cambridge University Press. <https://doi.org/10.1017/CBO9781139164771>
- Danesi, M. (2017). *The semiotics of emojis*. Bloomsbury. <https://doi.org/10.5040/9781474282024>
- Derks, D., Bos, A. E. R., & Grumbkow, J. v. (2008). Emoticons and online message interpretation. *Social Science Computer Review*, 26(3), 379-388. <https://doi.org/10.1177/0894439307311611>
- Dresner, E., & Herring, S. C. (2010). Functions of the nonverbal in CMC: Emoticons and illocutionary force. *Communication Theory*, 20(3), 249-268. <https://doi.org/10.1111/j.1468-2885.2010.01362.x>
- Drouin, M., & Davis, C. (2009). R u txtng? Is the use of text speak hurting your literacy? *Journal of Literacy Research*, 41(1), 46-67. <https://doi.org/10.1080/10862960802695131>
- Escoufflaire, L. (2020). *Building a typology of the linguistic functions of emoji: A cross-linguistic and cross-platform corpus analysis of emoji in conversation* [Master thesis, Catholic University of Louvain].
- Evans, V. (2017). *The emoji code: The linguistics behind smiley faces and scaredy cats*. Picador.
- Gallud, J. A., Fardoun, H. M., Andres, F., & Safa, N. (2018). A study on how older people use emojis. In *Proceedings of the XIX International Conference on Human Computer Interaction* (pp. 1-4). <https://doi.org/10.1145/3233824.3233861>
- General Authority for Statistics. (2020). *Saudi women: The partner of success*. https://www.stats.gov.sa/sites/default/files/woman_international_day_2020EN.pdf
- Giannoulis, E., & Wilde, L. R. (2019). *Emoticons, kaomoji, and emoji: The transformation of communication in the digital age*. Routledge. <https://doi.org/10.4324/9780429491757>
- Jaeger, S. R., Xia, Y., Lee, P. Y., Hunter, D. C., Beresford, M. K., & Ares, G. (2018). Emoji questionnaires can be used with a range of population segments: Findings relating to age, gender and frequency of emoji/emoticon use. *Food Quality and Preference*, 68, 397-410. <https://doi.org/10.1016/j.foodqual.2017.12.011>
- Jin, C. (2016). *WeChat as a medium to socialize into Chinese culture: The persistence of explicit hierarchy* [Master's thesis, The Ohio State University].
- Jones, L. L., Wurm, L. H., Norville, G. A., & Mullins, K. L. (2020). Sex differences in emoji use, familiarity, and valence. *Computers in Human Behavior*, 108, 106305. <https://doi.org/10.1016/j.chb.2020.106305>
- Kazmi, A., Rana, A., Anjum, U., & Khan, M. (2019). "A picture is worth a thousand words, and so is an emojis?" Emojisfication of language: A pragmatic analysis of Facebook discourse. In *PLLS 2019 Proceedings*.
- Kejriwal, M., Wang, Q., Li, H., & Wang, L. (2021). An empirical study of emoji usage on Twitter in linguistic and national contexts. *Online Social Networks and Media*, 24, 100149. <https://doi.org/10.1016/j.osnem.2021.100149>
- Kemp, S. (2020). *Digital 2020: Global digital overview*. <https://datareportal.com/reports/digital-2020-global-digital-overview>

- Kemp, S. (2023). *Digital 2020: Global digital overview*. <https://datareportal.com/reports/digital-2023-october-global-statshot>
- Koch, T. K., Romero, P., & Stachl, C. (2020). Age and gender in language, emoji, and emoticon usage in instant messages. *Computers in Human Behavior*, 126, 106990. <https://doi.org/10.1016/j.chb.2021.106990>
- Kothari, C. R. (2004). *Research methodology: Methods and techniques*. New Age International.
- Kumar, R. (2011). *Research methodology: A step-by-step guide for beginners*. SAGE.
- Levi, S., Hauthal, E., Mukherjee, S., & Ostermann, F. O. (2024). Visualizing emoji usage in geo-social media across time, space, and topic. *Frontiers in Communication*, 9. <https://doi.org/10.3389/fcomm.2024.1303629>
- Li, L., & Yang, Y. (2018). Pragmatic functions of emoji in internet-based communication—A corpus-based study. *Asian-Pacific Journal of Second and Foreign Language Education*, 3, 16. <https://doi.org/10.1186/s40862-018-0057-z>
- López-Rúa, P. (2021). Men and women on Twitter: A preliminary account of British emoji usage in terms of preferred topics and gender-related habits. *Language@ Internet*, 19, 3.
- Lu, X., Ai, W., Liu, X., Li, Q., Wang, N., Huang, G., & Mei, Q. (2016). Learning from the ubiquitous language. In *Proceedings of the 2016 ACM International Joint Conference on Pervasive and Ubiquitous Computing* (pp. 770-780). ACM. <https://doi.org/10.1145/2971648.2971724>
- Mackey, A., & Gass, S. M. (2016). *Second language research: Methodology and design*. Lawrence Erlbaum Associates.
- Mansour, I., & Mansour, A. (2019). An analysis of students' attitudes towards Twitter use for academic purposes: A case of Saudi undergraduate female students. *International Journal for Quality Assurance*, 2(2), 211-218. <https://doi.org/10.34028/ijqa/2/2/73>
- McCulloch, G. (2019). *Because internet: Understanding the new rules of language*. Riverhead Books.
- Michael, A., & Ruane, E. (2000). Netronyms and emoticons. *English Today*, 16(4), 40. <https://doi.org/10.1017/S0266078400000547>
- Miliany, K. (2014). The displacement effect of internet use among Saudi students. *Journal of Arab and Muslim Media Research*, 7(2-3), 185-204. https://doi.org/10.1386/jammr.7.2-3.185_1
- Mills, G. E., & Gay, L. R. (2016). *Educational research: Competencies for analysis and applications*. Pearson.
- Mustafa, R. F. (2017). *The impact of learning English as a foreign language on the identity and agency of Saudi women* [Doctoral dissertation, University of Exeter].
- Needleman, M. (2000). The Unicode standard. *Serials Review*, 26(2), 51-54. <https://doi.org/10.1080/00987913.2000.10764582>
- Negishi, M. (2014). Meet Shigetaka Kurita, the father of emoji. *The Wall Street Journal*. <https://www.wsj.com/articles/BL-JRTB-16473>
- Ohlheiser, A. (2016). There is no hijab emoji: This 15-year-old student is trying to change that. *The Washington Post*. <https://www.washingtonpost.com/news/the-intersect/wp/2016/09/13/there-is-no-hijab-emoji-this-15-year-old-student-is-trying-to-change-that/>
- Park, J. R., & El Mimouni, H. (2020). Emoticons and non-verbal communications across Arabic, English, and Korean tweets. *Global Knowledge, Memory and Communication*, 69(9), 579-595. <https://doi.org/10.1108/GKMC-02-2020-0021>
- Park, J., Barash, V., Fink, C., & Cha, M. (2013). Emoticon style: Interpreting differences in emoticons across cultures. In *Proceedings of the 7th International AAAI Conference on Weblogs and Social Media* (pp. 466-475). <https://doi.org/10.1609/icwsm.v7i1.14437>
- Persson, N. (2019). *Analysis of emoji usage: Differences in preference and function across genders* [Undergraduate thesis, Jönköping University].
- Prada, M., Rodrigues, D. L., Garrido, M. v., Lopes, D., Cavalheiro, B., & Gaspar, R. (2018). Motives, frequency and attitudes toward emoji and emoticon use. *Telematics and Informatics*, 35(7), 1925-1934. <https://doi.org/10.1016/j.tele.2018.06.005>
- Rezabek, L., & Cochenour, J. (1998). Visual cues in computer-mediated communication: Supplementing text with emoticons. *Journal of Visual Literacy*, 18(2), 201-215. <https://doi.org/10.1080/23796529.1998.11674539>
- Robertson, A., Magdy, W., & Goldwater, S. (2020). Emoji skin tone modifiers. *ACM Transactions on Social Computing*, 3(2), 11. <https://doi.org/10.1145/3377479>

- Saad, M., Jamaludin, N., & Yusuf, M. (2018). Analysis of the use of interpersonal communication emoji on WhatsApp use among students. In *Proceedings of the 5th International Conference on Social and Political Sciences* (pp. 193-196). <https://doi.org/10.2991/icosaps-18.2018.43>
- Salem, F. (2017). Social media and the internet of things towards data-driven policymaking in the Arab world: Potential, limits and concerns. *MBR School of Government*. <http://www.mbrsg.ae/getattachment/1383b88a-6eb9-476a-bae4-61903688099b/Arab-Social-Media-Report-2017>
- Shi, H., Liu, X., Li, K., & Xie, J. (2019). Emoji usage and interpersonal relationship in computer-mediated communication. In *Proceedings of International Joint Conference on Information, Media, and Engineering* (pp. 262-266). <https://doi.org/10.1109/IJCIME49369.2019.00059>
- Sia, J. K. M., Hii, I. S. H., Jong, L., & Low, W. (2024). Do emojis really help us to communicate better? Investigating instructor credibility, students' learning motivation, and performance. *Education and Information Technology*. <https://doi.org/10.1007/s10639-024-12536-y>
- Spina, S. (2019). Role of emoticons as structural markers in Twitter interactions. *Discourse Processes*, 56(4), 345-362. <https://doi.org/10.1080/0163853X.2018.1510654>
- Stanton, A. L. (2018). Islamic emoticons and religious authority: Emerging practices, shifting paradigms. *Contemporary Islam*, 12(2), 153-171. <https://doi.org/10.1007/s11562-017-0412-8>
- Swan, C. (2019). *The big five and emoji use in instant messaging: Can emotional indicators in instant messaging reveal personality traits?* [Master's thesis, Dún Laoghaire Institute of Art, Design and Technology].
- Tandyonomanu, D. (2018). Emoji: Representations of nonverbal symbols in communication technology. *IOP Conference Series: Materials Science and Engineering*, 288, 012052. <https://doi.org/10.1088/1757-899X/288/1/012052>
- Yus, F. (2019). *Emoji: A full cyberpragmatic approach* [Conference presentation]. The 16th China Pragmatics Conference.

