



Articles

#HappyAnniversary: Gender and Age Differences in Spouses' and Partners' Twitter Greetings

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Abstract

Research and theory suggest that men, on average, are inhibited from expressing vulnerable emotions such as love, whereas women do so more readily. Based on theories of gender socialization and social media uses and gratifications, we conducted a content analysis of gender differences in the domain of wedding and other relationship anniversary greetings delivered on Twitter (N = 414 tweets). We tested for gender as well as age differences in three areas: symbolic (emoji), photographic, and verbal content. As hypothesized, women were more likely to use emojis than were men. Most tweeters who included photographs in their greetings used photos of themselves and their partners today, although some subgroups of men and women preferred photos from their weddings. Age-related differences were clear: young-adult tweeters preferred symbolic emojis to deliver their anniversary greetings, whereas older/middle-aged adults opted for verbal/textual communication, particularly in the areas of tribute and inspirational statements and humor. Results are discussed in terms of gender-role socialization, social and cultural norms, and modes of communication (e.g., written letters and notes, smartphone texts) during different historical eras.

Keywords: anniversary, emoji, gender, Twitter, uses and gratifications theory, wedding

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Gender differences in emotional communication are a longstanding topic in the study of interpersonal interaction (Floyd, 2006). Research suggests that boys and men, on average, are more inhibited than are girls and women from expressing emotions that can make one seem “soft,” “weak,” or vulnerable to rejection, including love. For example, child development research suggests that the gender difference of girls crying more frequently than boys emerges before puberty, seemingly ruling out a heavily hormonal explanation (Vingerhoets, Bylsma, & Rottenberg, 2009). Vingerhoets and colleagues (2009) note that boys who cry may be discouraged and ridiculed by parents and peers, whereas for girls, crying is more socially acceptable. As boys move into adolescence and young adulthood, similar pressures continue, as they are socialized toward hypermasculinity and emotional reticence (Kimmel, 2008). For example, boys may be teased by other boys for expressions of compassion and caring.

One method for studying emotional communication, not requiring laboratory experiments or field observations of live interactions, is content analysis of public statements via media outlets. As one example, [Gonzalez and Koestner \(2006\)](#) compared men's and women's Valentine's greetings for their spouses or partners in personal ads from the Montreal newspaper *The Gazette*. These authors premised their study on gender socialization differences and prior literature showing that "men feel less comfortable than women do in expressing vulnerable emotions" (p. 768), including love, but that men are more likely to express pride. Results indeed showed women to express more frequent love and commitment-fidelity in their Valentine's messages than did men. However, men expressed more frequent praise of their partners.

Our study, which compares men's and women's Twitter tweets on couples' anniversaries, represents a modern updating and replication attempt of the [Gonzalez and Koestner \(2006\)](#) study. Numerous changes have occurred since 2006 in the availability of media outlets for disseminating personal messages, the graphical and artistic capabilities of these outlets, and the whole nature of sharing one's comments with the public. Although many city-based newspapers had created Internet versions by 2006, it is likely that these were read mostly by people who currently or formerly lived in the city of the newspaper. Today's social media websites such as Twitter, Facebook, and Instagram, in contrast, operate worldwide, so visitors will almost certainly see messages from beyond their own city. In terms of graphic arts, the kinds of newspaper personal-ad messages analyzed by [Gonzalez and Koestner \(2006\)](#) consisted of text and icons such as hearts or puckered lips. Newspaper personal-ads offered the sender far fewer options than are available on Twitter and other contemporary social media sites today (i.e., photographs, videos, and a broader selection of emojis, which are cartoonish images of smiley faces, winks, and so forth). Lastly, the nature of sending public messages has also changed. Placing a newspaper personal advertisement was likely a one-time experience for the message-sender or at least something done only rarely. Today's social media accounts, whether on Twitter or other services, give any user a permanent platform from which to post messages on a continuous basis, perhaps multiple messages per day and thousands per year.

In a sense, every social media user today can establish a lingering public persona, of which anniversary greetings are a part. How might the passage of time and these changes in social media opportunities affect the delivery of couples' greetings today vs. in the early 2000's? One possibility is that users' stylistic aspects of delivering greetings will have become more individualized and idiosyncratic over time. With so many options for using different combinations of emojis, photos, and videos in social media, individual senders may have developed their own unique blends of elements used in their messages. If so, it would become less likely that characteristic male and female styles exist, and more likely that within-gender variation would reduce differences between men's and women's messages, on average. Whether gender differences in the nature of romantic greetings (in this case to celebrate anniversaries) are diminished relative to 2006 in line with the above conjecture, or remain robust, remains to be seen.

Twitter

Twitter is estimated to have 330 million users worldwide ([Oberlo, 2019](#)). Users compose brief verbal messages known as "tweets," containing up to 140 characters and, if the tweeter chooses, photographs, videos, emojis, and/or links to other web content. Twitter use, more so than other social media platforms, is significantly associated with greater relationship satisfaction ([Woods, 2015](#)), presumably because Twitter offers "a way of connecting and engaging with other individuals in a less threatening manner" (p. 85). Once a tweet appears on

the Twitter website, users can “like” a message, retweet it to other users, and/or tweet replies to the original message. One other important feature of Twitter is the “hashtag” (symbolized as #), which users can place before a word or phrase (e.g., #HappyAnniversary). Hashtags serve at least two purposes. First, visitors to Twitter can search on a given hashtag (e.g., #COVID-19) to retrieve other users’ messages with the same hashtag; in this sense, a hashtag creates a directory of messages within the same topic. Second, hashtags at the end of a tweet can serve as a flourish to reinforce and accentuate the main textual content (e.g., the hypothetical tweet: “It is important to maintain proper safety precautions during COVID-19. #socialdistancing #wearamask #staysafe”).

Of the major social media platforms available today, namely Twitter, Facebook, and Instagram, Twitter is best suited for our purposes. It is a vast forum for sharing one’s ideas, opinions, and news (Forsey, 2020). By default, visitors to Twitter can follow and read tweets from anyone who posts them (although users can override the default to restrict potential followers and who sees their tweets). Facebook is geared more toward sharing information with one’s friends and family members (Forsey, 2020), with each user having extensive gatekeeping control over who is allowed into his or her network. Reasons one might use Twitter instead of Facebook include a desire to publicize one’s business or career (e.g., as a beginning author or musician) beyond one’s immediate family/friend network, an interest in reading the tweets of public figures (e.g., celebrities, athletes, politicians), and a wish to establish communication with others who share similar hobbies and interests. Finally, Instagram is focused primarily on the sharing of photographs (Forsey, 2020). Where appropriate however, we draw examples from social media sites other than Twitter.

Theories and Conceptual Perspectives

The present study draws upon multiple conceptual sources, some of which are full-fledged theories, whereas others, while coherent lenses for viewing a given phenomena, are not as extensively formalized as theories. The latter are perhaps better described as *perspectives*. These theories and perspectives include uses and gratifications theory from communication studies, gender-socialization perspectives, and aging and historical-context perspectives, all of which have helped us derive hypotheses and research questions (listed below) regarding possible gender and age differences in the content of anniversary greetings.

Uses and Gratification Theory

As a theoretical backdrop to the present study, uses and gratification theory (Blumler, Katz, & Gurevitch, 1974) is one relevant framework. Uses and gratification theory situates our study within the larger field of media consumption, in terms of why people post on Twitter. Toubia and Stephen (2013) identified two broad dimensions of reasons for posting on Twitter, intrinsic (i.e., enjoyment of the activity in itself) and image-related (i.e., seeking to boost others’ impression of oneself). Whiting and Williams (2013) conducted an exploratory study in which users were asked their reasons for engaging with social media. Analyses yielded 10 uses-and-gratifications themes: social interaction, information seeking, passing the time, entertainment, relaxation, expressing opinions, communicatory utility (“giv[ing] them things to talk about,” p. 367), convenience/easy accessibility, information sharing, and surveillance/knowledge about others. Of these, information sharing is most relevant to our purposes, in that those issuing the tweets are sharing information with the world that it is their anniversary and that they hold certain feelings for their spouse/partner. According to Whiting and Williams (2013), “Many respondents mentioned that they like to post updates and share pictures” (p. 367). Updating others and displaying pictures are very much part of anniversary tweets.

A further reason why individuals may post anniversary messages on Twitter and other social media is to announce, and thereby protect, one's relationship (Krueger & Forest, 2020). What these authors term a "dyadic display" can be anything from wearing a wedding ring to holding hands in public to using the "Married" or "In a relationship with..." options in one's Facebook profile. Such displays announce that one is in a relationship, to deter potential suitors from making romantic overtures toward either of the partners. In support of their ideas, Krueger and Forest (2020) found empirical associations between partnered, Facebook-using individuals' responses to a questionnaire measure of relationship-protection motivation and their Facebook dyadic displays; this result held, even controlling for relationship satisfaction and other measures of relationship closeness. Protecting their relationship may well be one reason some people post anniversary greetings on Twitter. Other reasons could include the feeling that personal events are not "real" until they have been documented in social media (as in the term that a relationship is "Facebook official"; Robards & Lincoln, 2016) and individuals' desire to see how others respond to their tweets. Phenomena such as using social media for relationship protection and/or to declare one's relationship "official" are likely much more prevalent today than they were at the time of the Gonzalez and Koestner (2006) newspaper study, if they even existed at all back then. Thus, along with other changes in social media opportunities between 2006 and today (discussed above), relationship-protective and -declarative motivations on the part of both men and women may make their behaviors on social media more similar than they were before, hence warranting re-examination of gender differences in media greeting content as a follow-up to Gonzalez and Koestner (2006).

Gender Socialization

More directly inspiring our hypotheses are various perspectives and findings pertaining to gender socialization and emotional vulnerability. As noted above, starting in childhood and continuing into adolescence and young adulthood, boys and men are more likely than girls and women to be discouraged from, and punished for, expressing vulnerable emotions such as love and compassion (Gonzalez & Koestner, 2006; Kimmel, 2008; Vingerhoets et al., 2009). In addition, social context relating to gender matters in the judged appropriateness of different kinds of emotional expression, including emoji use (Butterworth, Giuliano, White, Cantu, & Fraser, 2019; Wolf, 2000). Butterworth and colleagues showed undergraduate research participants a hypothetical e-mail message to a female employee thanking her for filling in while the sender, a fellow employee, was sick. To create the necessary experimental conditions, the message was said to come from either a male or female sender, and was accompanied by either affectionate (e.g., kissing-face) or friendly (e.g., smiley-face) emojis. As would be expected for this context, the combination of a male sender including affectionate emojis was rated by participants as least appropriate, compared to other combinations. Wolf (2000) examined the use of emoticons (precursors of emojis, consisting of punctuation marks such as a colon and closing parenthesis for a smile) in four newsgroups/discussion forums, one predominantly used by men (Dallas Cowboys football), one predominantly used by women (eating disorders), and two considered balanced (divorce and depression). Both men and women used broader sets of emoticons in the mixed-sex rather than predominantly same-sex groups, again illustrating the importance of social context. Hence, Twitter anniversary greetings may also be constrained by perceived norms of gender appropriateness (e.g., overly affectionate male greetings may be inhibited).

In terms of uses and gratifications theory, women and men appear to have somewhat different motivations for sharing information on social networking sites (SNS). For example, the association between commitment to a SNS community and inclination to share information on these sites tended to be stronger in women than in

men, suggesting women have a strong interest in maintaining the activity and vitality of their online groups. Men's salient concern, in contrast, is more likely conformity, to express opinions supported by their social networks (Lin & Wang, 2020). Because Twitter users direct their tweets mainly at recipients of the same gender (63% gender homophily, as estimated by Bamman, Eisenstein, & Schnoebelen, 2014), men are thus primarily concerned with how their tweets will be perceived by other men, whereas women are concerned less with this aspect and more with maintaining their commitment to the particular online community. This concern with conformity on the part of boys and men, as discussed above, is what Kimmel (2008) posits to be the key mechanism in inhibiting their expression of vulnerable emotions.

Age and Historical Contexts

Age *per se* has not generally been associated with differences in media uses and gratifications, leading researchers to suggest the importance of "contextual age" (Chang, Choi, Bazarova, & Löckenhoff, 2015). The latter examines age in conjunction with physical and psychological health, economic status, social-interaction patterns, etc. We do not propose purely age-driven differences in Twitter communication (e.g., that 60-year-olds would always differ in the same way from 30-year-olds regardless of historical era), but likewise view age in conjunction with historical context. Computer technology has evolved rapidly over the past half-century from being available only in some corporate, government, and university settings, to initial household adoption of personal computers (pre-Internet), to arrival of the Internet, and finally to Internet capability on mobile phones the size of one's hand. Statistics from the 2000's have shown personal computer and Internet use to be most readily adopted by younger, rather than older, adults (Mitzner et al., 2010). Further, relatively new innovations such as emojis and social media websites came along when many older adults had already firmly established their own communication and recreational habits (e.g., talking on the telephone, watching television). However, 30 years from now, the 50-year-olds who are today's 20-year-olds may well appear extremely savvy in their technology use! In short, any age differences obtained in the present study should be viewed in historical context.

Twitter Content Assessed in the Present Study

Emojis

Emojis have inspired a growing literature in their own right. Prada et al. (2018) found general emoji use and favorable attitudes toward their use to be higher in women than in men, and in younger participants than older ones (the sample ranged from 17-67 years old). Barbieri, Ronzano, and Saggion (2016) cluster-analyzed emojis commonly used on Twitter, yielding groupings such as "things are good" (thumbs up, OK sign, sun glasses); heart and smiley faces; alcoholic beverages and other food; and emotions such as laughing and crying. The most commonly used emojis (e.g., smiley faces) cannot, of course, capture all emoji uses romantic partners, friends, and other associates engage in. Pairs of people sometimes make idiosyncratic use of emojis in ways that are meaningful within their own relationship, but obscure to outside observers (e.g., using a slice of pizza emoji as a sign of love because they jointly "love" pizza; Wiseman & Gould, 2018). We coded both the overall presence (vs. absence) of emojis in tweets and for the emojis' characteristics, using Barbieri and colleagues' (2016) scheme.

Photographs

In the present context, photographs (if used with the tweets) tended to be either current (i.e., how the spouses or partners look today) or older ones from the wedding. Nostalgia, which also serves as a link to the self-con-

cept (Baldwin, Biernat, & Landau, 2015), may be one motivating factor to use a wedding photo. Our coding of pictures revolved around the distinction of current vs. wedding photos.

Text

Those who post personal greetings on Twitter are, of course, actually communicating with two audiences, the spouse/partner and the broader universe of anyone who might come upon the tweet (most likely family and friends, but not limited to them). Issues of self-presentation naturally come to the fore. A tweeter may wish to post a heartfelt greeting to his or her spouse or partner on their anniversary, but may be conscious of how the message will be received by Twitter readers more broadly. Verbal/textual references such as humor, using a pet name (e.g., “Sweetie”) for the spouse/partner, and complimenting the spouse/partner may make one look clever, playful, appreciative, or magnanimous. Other types of references, such as religious or scriptural quotes, may reflect important aspects of the tweeter’s (or the family’s) identity and values. Some readers may wonder, though, whether such touches are authentic or were made to impress the broader audience. Marwick and Boyd (2011) note that: “Self-presentation on Twitter takes place through ongoing ‘tweets’ and conversations with others... The potential diversity of readership on Twitter ruptures the ability to vary self-presentation based on audience, and thus manage discrete impressions” (p. 116). In the present study, we coded for the aforementioned themes (e.g., humor, pet names, tributes, religion) in textual references, but cannot at this point parse tweeters’ possibly competing self-presentation motives.

Present Study

We compared emojis, photographs, and verbal references (e.g., “my best friend”) in men’s and women’s tweets on Twitter marking a wedding or relationship anniversary. Do men and women differ in the kinds of anniversary messages they send to their spouses or partners via this platform? Given possible generational differences in social media use (Prada et al., 2018; Twenge, 2017), we also investigated age differences in anniversary tweets. Based on studies showing that women tend to express vulnerable emotions, including love, more readily than do men (Gonzalez & Koestner, 2006) and consideration of tweeters’ ages and historical contexts growing up, we proposed the following hypotheses and exploratory research questions:

H1. Women’s (relative to men’s) tweets will more frequently feature heart/smiley and laughing/crying emojis, as well as verbal declarations of vulnerable emotions.

H2. In contrast, men will make more frequent use of “things are good” and alcohol/food emojis, along with verbal statements of pride in, and praise for, their partners.

RQ1. Will characteristics of anniversary tweets vary as a direct (main effect) of age?

RQ2. Will characteristics of anniversary tweets vary as a function of age-by-gender interactions (i.e., age differences within one gender but not the other, or gender differences at some ages but not others)?

Method

Sample and Procedure

Students in an undergraduate research methods class coded Twitter tweets containing wedding/relationship anniversary greetings. Each coder was given a unique date from September 12 to October 16, 2019 (a time-frame allowing the coders to see the results from their work by the end of the semester), and was instructed to code all tweets that could be located via the hashtag *#HappyAnniversary* (i.e., bringing up all tweets in which the tweeter had included this hashtag) for that date. (At least one coder visually inspected all tweets for his or her day and collected any with the phrase “Happy Anniversary,” regardless of whether a hashtag adjoined it. We retained these tweets, as they contained the necessary information for coding.) Coders whose day contained few such tweets could request a new day; hence, some of the days in the above time window were not used. Coding sheets were received from 28 students. Anniversary tweets other than those from one spouse/romantic partner to another (e.g., a child wishing his or her parents a happy anniversary) were excluded. A total of 414 tweets (each one unique to a different tweeter) was retained, roughly 15 per coder. The present study is registered at the Open Science Framework (see [Supplementary Materials](#) section). Variables that were coded, along with the criteria for doing so, are described in the following paragraphs.

Measures

Each tweet was coded along several dimensions. Coders received an Excel sheet with the headings already listed, to facilitate their coding. For each line of data, corresponding to one tweet, coders first recorded the tweeter’s Twitter moniker, so that the senior author (the course professor) could examine the tweet in case of coding ambiguities and resolve the coding issue.

Demographic Variables

Demographic information was coded via context clues potentially available in the tweets (name of tweeter, name of recipient, photographs [from which coders could look at clothing, styles of jewelry, etc.], and verbal content such as how long a couple had been married or been together, or any references to the partner indicating the relationship status or gender of the partner such as “my husband” or “my wife”). Coders recorded their inference or estimation of: each tweeter’s sex and sexual orientation (heterosexual man, heterosexual woman, gay male, or lesbian female); each partner’s race/ethnicity (White, Black, Hispanic, Asian/Asian-American, mixed-race, other); and each partner’s current age (under 20, 20’s, 30’s, 40’s, 50’s, 60’s, 70’s, or 80’s and older). Objective data such as how many years the partners had dated, been married, and/or been together in total (dating plus marriage) were recorded, if mentioned in a tweet. If a number of years together was stated in the tweet, but not whether it was the length of marriage or dating, we assumed it was length of marriage, as marriage was by far the most common status among couples (nearly 70% of couples in the dataset alluded to a “wedding,” “husband, or “wife,” or displayed a wedding photo; very few tweets mentioned a non-marital relationship; and the rest were inconclusive).

Whereas some of the coding dimensions were highly objective (e.g., whether an emoji was used), others were more subjective. Tweeters’ and recipients’ gender could be ambiguous in the absence of clear cues (e.g., a conventional male or female proper name in the user’s moniker, or reference to a “husband” or “wife”). Also, age estimation even from a clear photo is difficult, with accuracy varying as a function of perceivers’ and

targets' ages, and targets' facial expressions (Voelkle, Ebner, Lindenberger, & Riediger, 2012). Accordingly, for the first 48 tweets in our dataset (12% of the total) that included photographs and were still available (e.g., not deleted by the user or dropped from the user's displayed tweets due to a large volume of newer tweets), a member of the authorship team independently provided secondary coding judgments for gender and age-range of the tweeter and tweet-recipient. These secondary codes were then compared with the original ones. Primary and secondary coders exhibited 96% agreement (on 46 out of 48 tweets) on whether the tweeter was a heterosexual man, heterosexual woman, gay male, or lesbian female. For age-range, each pictured spouse or partner was assigned a score such as 20's = 2, 30's = 3, etc., with the two partners' scores averaged to yield a couple score. The correlation between the primary and secondary coder's age-related judgments was $r = .85$. Hence, inter-rater reliability on gender and age was high.

Emoji Use

Several aspects of emoji use were coded. Coders first recorded whether a given tweet used *one or more emojis* (coded as 1) or *none* (0). If at least one emoji was used, coders entered the types of emojis in the Excel sheet (e.g., heart, champagne bottle or glass). An undergraduate student assistant in Spring 2020 (who was in the Fall 2019 research methods class and, thus, one of the original data collectors) assigned all the listed emojis into the five (out of 11) most relevant categories from Barbieri et al. (2016) ("*things are good*," *hearts*, *combined heart-smiley faces*, *alcohol/food*, and *laughing/crying*), under the supervision of the senior author. For example, if a tweet included a thumbs-up and OK sign, it would receive a 1 for the "things are good" category for having one or more of these emojis. Because multiple emojis could appear in the same tweet, a tweet could receive a 1 for more than one category. Heart emojis and heart-smiley face emoji combinations were the only emojis examined, as these were the only type with sufficiently high usage base rates, in our judgment (67% and 32% of emoji users, respectively).

Use of Photographs

Several aspects of tweeters' use of photographs, if any, were coded. The main variable categorized tweets as to the use of *no photo* (0), *current couple photo* (1), *wedding photo* (2), *both* (3), or *other photo* (4). For tweets with at least one photo, the student coders noted (*yes/no*) whether the photo(s) included public displays of affection (PDA) by the couple and, if present, wrote in descriptions of the displays. The student assistant later coded PDAs into: *photo present but no PDA* (0), *hug only* (1), *kiss only* (2), *hug and kiss* (3), and *other*, e.g., *holding hands* (4); the PDA variable was coded as missing if there was no photo.

Verbal/Textual Content

Verbal/textual content of the tweets was coded for many kinds of references (*yes* = 1/*no* = 0). These included: mention of how the couple met; whether the tweeter said "I love you;" tributes or inspirational references (e.g., "You've made me a stronger person"); references to struggles and/or overcoming adversity; religious/scriptural references; humor (e.g., "You sentenced me to life"); pet names (e.g., "My Honey Bear"); statements that the marriage/relationship is better than one could have expected; statements that marriage/relationship keeps getting better; stated or implied future commitment (e.g., "To 30 more years!"); reference to spouse/partner as the tweeter's "best friend;" reference to spouse/partner as the tweeter's "soulmate;" and mention of children. Each of these types of tweets was a freestanding category and was analyzed separately.

Results

Descriptive Information

Table 1 compares the present sample on age, gender, and race/ethnicity with overall U.S. and worldwide statistics on Twitter users. Note that, because the coders filtered their searches through the hashtag *#HappyAnniversary* to target anniversary-greeting tweets specifically, we were not taking a random sample of *all* tweets. Given the increasingly delayed median age at first marriage in the U.S. (men's approaching 30 and women's 28; U.S. Census Bureau, 2019), people celebrating wedding (or non-marital) anniversaries would likely be older than Twitter users at large. Indeed, 82.5% of our tweeters were in their 30s through 60s, whereas individuals in this general age range comprise around two-thirds of Twitter users in the U.S. and worldwide. Because gay males ($n = 12$) and lesbians ($n = 9$) comprised a relatively low share of our sample compared to heterosexual men ($n = 186$) and women ($n = 205$), we collapsed across same- and opposite-sex tweeters into simply men and women (two participants had missing data). Consistent with U.S. base rates of Twitter users, our sample was roughly 50/50 women and men. Slightly over two-thirds of our tweeters were White (67.6%) compared to 60% in the U.S. baseline. Our share of Black tweeters was higher (16% vs. 11% U.S. baseline), and of Hispanic tweeters lower (7.7% vs. 17% U.S. baseline), than U.S. base rates. Asian/Asian-American tweeters comprised 5.2% of our sample, but a baseline figure for this group was not available.

Table 1

Comparison of Present Sample Demographics (Estimated From Tweeters' Names and Photos) to Overall Twitter User Statistics

Demographic dimension	Present sample	Among Twitter users overall
Age	82.5% in 30s through 60s	63% between 35-65 ^a ; 63% between 30-64 ^b
Gender	52.1% female, 47.8% male	66% male, 34% female ^a ; 50% male, 50% female ^b
Race/Ethnicity	67.6% White, 16.0 Black, 7.7% Hispanic, 5.2% Asian	60% White, 17% Hispanic, 11% Black ^b

^aOberlo (2019) worldwide; ^bWojcik & Hughes (2019) United States.

Log-Linear Models

Given that all our variables were categorical (age group was *ordered* categorical), we used log-linear modeling with backward elimination (Berger, 2017) as our primary analytic tool. Gender (*male, female*) and age group (*collapsed into 20's or younger, 30's, 40's, and 50's or older*) served as predictors of various dichotomous (e.g., any use of emojis) and polytomous (e.g., type of photo) outcomes. For simplification, analyses included only couples in which both partners were estimated to be in the same age decade (e.g., 20's, 30's); there were only eight couples in which the partners appeared to be in different age decades. Each log-linear analysis began with a saturated model, in which all variables were allowed to relate to each other (e.g., age group and gender interactively relating to emoji use, age group relating to emoji use, gender relating to emoji use, and age relating to gender) and which, of necessity, perfectly fit the data. At each step, associations whose removal would not significantly harm model fit were eliminated (i.e., in "backwards" fashion after starting with a saturated model), until no such "harmless" associations remained and a final model was reached. These analyses are summarized in Table 2.

Table 2

Predicting Presence of Certain Content in Tweets From Gender and Age Group

Content element	Final model	Interpretation
Emoji (Any vs. None)	Main effects of gender and age on emoji use ($\chi^2 [6, N = 363] = 4.2, p = .66$)	Women (63.5%) used emojis at higher rate than men (36.8%); usage highest in 20-and-younger (71.0%), lowest in 50-and-older (42.9%)
Heart emoji (vs. not)	No association among variables	N/A
Heart-smiley face combination emojis (vs. not)	No association among variables	N/A
Photo (None, Current, Wedding, Both, or Other)	Gender by age interaction in predicting type of photo display (saturated model; $\chi^2 [0, N = 359] = 0$, automatically perfect fit)	In most gender-age subgroups, current photo most commonly used; however, the following groups' mode was using wedding photo: men in their 30's (40.8%) and women in their 40's (36.0%)
Public Display of Affection (none, hug only, kiss only, both, other; recorded only if photo used)	No association among variables	N/A
Use of "I love you" (or similar) in text (vs. not)	No association among variables	N/A
Tribute/inspiration in text (vs. not)	Main effect of age on use of tribute ($\chi^2 [8, N = 362] = 13.0, p = .11$)	Participants 50 or older (27.0%) stated tributes the most often, decreasing with each decade of age to 8.1% in 20's or younger
Humor in text (vs. not)	Main effect of age on use of humor ($\chi^2 [8, N = 364] = 6.7, p = .57$)	Participants 50 or older (38.1%) had a much higher rate of humor use than younger age groups (from 17-21%)
Pet name in text (vs. not)	No association among variables	N/A
Commitment (vs. not)	No association among variables	N/A

Use of any emojis (vs. none) was higher in women than in men (consistent with H1), and in younger age groups than in older (answering RQ1). Follow-up analyses among emoji users to probe for gender and/or age effects for use of heart emojis and heart-smiley face combination emojis, as per Barbieri et al.'s (2016) clusters, did not yield significant associations.

A saturated model emerged as the best model for predicting type of photograph displayed in the tweet (*none, current, wedding, both, other*), signifying an interaction between gender and age (RQ2). The nature of this somewhat complex interaction was that, in most sex-age subgroups (e.g., men in their 20's or younger, women in their 20's or younger, women in their 30's), a current photo was most commonly used. However, using a wedding photo was the modal display for men in their 30's (40.8% of this subgroup) and women in their 40's (36.0%). No significant associations emerged in predicting types of public displays of affection.

The final set of analyses involved the verbal/textual references. Only references that appeared in approximately 20% or more of all tweets – *love, tribute/inspiration, humor, pet name, and commitment* – were analyzed. Two

of these references showed significant associations with age group (RQ1). Regarding tributes and inspirational statements, 27.0% of participants 50 or older issued these, decreasing with each decade of age to 8.1% in participants 20's or younger. Also, those 50 or older (38.1%) used humor more frequently than younger age groups (from 17-21%).

Discussion

Though we couched our study mainly in terms of expected gender differences – and did find some of these – the number of significant results was greater for tweeters' age groups. [Gonzalez and Koestner \(2006\)](#), who examined only verbal/textual references in Valentine's greetings, found women to exceed men in most of the affective categories (including love), which they suggested may stem from gender socialization. Our finding that, as expected (H1), women exhibited greater overall emoji use than did men in their anniversary greetings is, thus, a *conceptual* replication of [Gonzalez and Koestner \(2006\)](#). This finding is consistent with the notion of boys and men's being socialized to inhibit emotional expressions of love, compassion, caring, and vulnerability ([Kimmel, 2008](#); [Vingerhoets et al., 2009](#)), although future research, ideally longitudinal, is necessary to document these processes.

Also, whereas most tweeters in our study who included photos tended to use photos of how they and their partner looked in 2019 (i.e., current photos), women in their 40's (along with men in their 30's) instead reached back into their albums and heavily tweeted photos from their weddings. These findings suggest some level of nostalgia ([Baldwin et al., 2015](#)) and romanticism in subgroups of early middle-aged women and somewhat younger men. Why some age groups and not others, within particular historical contexts, might be inclined to nostalgia is worth exploring in future research. However, because subgroups of both women and men tweeted wedding photos, our findings regarding photos do not support the theme of gender differences in emotion socialization and expression.

Age-related results showed that whereas the youngest tweeters were more likely than their older counterparts to use emojis, the oldest tweeters were more likely than younger ones to make verbal/textual tributes or inspirational statements and to use humor. Hence, although age-related differences in uses and gratifications have been weak in prior literature ([Chang et al., 2015](#)), it appears in our study that younger and older tweeters, at least on the occasion of an anniversary, employed social media for different uses or purposes. These differences appear to center on younger tweeters' affinity for symbolic/artistic forms of expression and older tweeters' preference for verbal/textual expression, in keeping with the historical developments in access to computer technology and its available features we described earlier. [Pardes \(2018\)](#) traces the emergence of emojis to a Japanese designer in 1999, intended for use on mobile phones in that country. Hence, people growing up in the 1950s and '60s, as some of the studied tweeters did, would have been used to many years of writing by hand and on old-fashioned typewriters, before personal computers and smartphones came along for that purpose, likely carrying over into these older tweeters' continued reliance on verbal/textual expression. In contrast, use of emojis and newer technological features would be second nature to today's younger tweeters.

In addition, as discussed above, social-contextual norms likely affect men's and women's chosen forms of communication. Looking at happy/smiling faces more broadly, [Rind and Bordia \(1996\)](#) found in a field experiment that when female restaurant servers drew a happy/smiling face on the back of their customers' checks,

it increased the servers' tips relative to a control/no-drawing condition. Drawing a happy/smiling face did not, however, increase male servers' tips, which the study's authors attributed to gender-role incongruity. This type of normative inhibition could go a long way toward explaining our finding of women's, rather than men's, greater emoji use in their anniversary greetings. For this conjecture to hold true, however, (a) using emotional faces would still have to be somewhat taboo for men nearly a quarter-century after the restaurant-tipping study and (b) this norm would have to extend beyond domains such as restaurant tipping.

Strengths, Limitations, and Future Research

The present study had the strength of being conducted entirely without participant reactivity; the people who tweeted anniversary greetings to their spouses and partners would have had no idea their communications would be used for research purposes and so presumably would not have tried to present themselves favorably, as in a laboratory experiment or survey. Posting on Twitter likely carries some pressure to present oneself in a positive light to one's audience, but the brevity of the tweets makes it difficult to cultivate an image too elaborately. As noted, those who post personal greetings on Twitter are communicating with two audiences, the spouse/partner and the broader universe of anyone who might come upon the tweet. Parsing out these dual motivations – toward the partner and toward the broader audience – warrants further research. Like all studies, the present one also had limitations, most prominently the fact that some of our key variables, such as age, had to be estimated rather than measured directly. In addition, although attempts to systematically classify emojis (Barbieri et al., 2016) are worthwhile, samples much larger than the present one may be necessary to detect group differences in the use of low base-rate emojis.

Conclusions

In conclusion, from a uses and gratifications perspective (Whiting & Williams, 2013), relationship-protection motives (Krueger & Forest, 2020) may be a powerful factor leading married persons or those in other relationships to post greetings to their partners on social media in the first place. We did not test that proposition. We did test – inferentially at least – whether gender (either through childhood socialization or contemporary social norms) and age (likely representing whether one grew up in the smartphone age; Twenge, 2017) affected different types of expression in Twitter-based anniversary greetings, however. Results supported the idea that they did.

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Competing Interests

The authors have declared that no competing interests exist.

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Supplementary Materials

The actual coding sheet used by the students (including definitions, examples, and scoring for all coding dimensions) is available via <https://osf.io/rf7qk>.

Index of Supplementary Materials

Reifman, A., Ursua-Benitez, M., Niehuis, S., Willis-Grossmann, E., & Thacker, M. (2020). *Supplementary materials to: #HappyAnniversary: Gender and age differences in spouses' and partners' Twitter greetings* [Coding sheet]. OSF. <https://osf.io/rf7qk>

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