Exaggeration of emotional responses in online communication

Avner Caspi [a,*], Shir Etgar [b]

[a] Department of Education and Psychology, Open University of Israel, Israel
[b] DAN Department of Communication, Tel Aviv University, Israel

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ABSTRACT

Two studies tested differences in reported (Study 1, N = 197) and perceived (Study 2, N = 875) level of exaggerated emotional responses published on four online platforms: Facebook, WhatsApp, Instagram, and email. We found differences between platforms that may reflect divergent communication norms. Participants judged the level of exaggeration by comparing a given message to a message that they would have published as well as to the norms that govern the communication platform. Overall, participants reported that they exaggerated less than other users. Content format (text, picture, or video) and perceived privacy level moderated the impact of the platform on judgment of exaggeration. We suggest that since online media filter out communication cues, users tend to amplify their emotional responses. This amplification generates an atmosphere in which exaggerating is the norm of communication.

People use emotional expressions to communicate their internal state to others (Parkinson, 1996; Shariff & Tracy, 2011; Van Kleef et al., 2011). Emotional reaction signals that something that happens in the environment is important to us and touches our basic needs (Mongrain & Vettese, 2003). Emotional expressions can also be seen as performative actions being constituted in part through orientation to- and coordination with- what others are doing in a given situation (Du Bois, 2007; Goodwin et al., 2012). By using an appropriate emotional response, we may help our communication partners reassure their own experience and validate their feelings, thus affecting their well-being, and strengthening our bond with them. Our emotional reaction might also be important for those who observe the situation, indicating the appropriate reaction to a given behavior. For these reasons, emotional responses must be perceived as suitable to the situation and as socially acceptable. Furthermore, emotional responses may teach us about the behavioral *norms* of different environments.

The suitability or acceptance of emotional expression is known as "display rules" (Ekman & Friesen, 1969), and these rules reflect cultural agreement as to who can show which emotion, and in which situation (Averill, 1982; Ekman, 1993; Matsumoto et al., 2008; Van Kleef et al., 2011). Display rules are activated by interpersonal processes (Parkinson, 1996) and in part contextualize the meaning of the situation (Greenaway et al., 2018). An emotional expression that qualitatively or quantitatively violates social norms might be sanctioned by negative responses (Cheshin, 2020; Saarni, 1988; Sommers, 1984). When

emotional expressions are exaggerated, they may violate social norms. We suggest that an *inappropriate* emotional response is an emotional expression that does not match the situation (e.g., expressing happiness in a sad situation), or the lack of expression of an expected emotion (e.g., not expressing sadness in a sad situation) (Gelfand et al., 2011). In some of these cases, the mismatch between the situation and the expressed emotion might be perceived as an exaggeration. In contrast, an *appropriately* exaggerated emotional response occurs when the recipient anticipates a given emotion, and this emotion is expressed in an amplified manner (e.g., over-reacting in a sad situation) (Greenaway & Kalokerinos, 2017; Hochschild, 1983; Shields, 2005). Expressing appropriate exaggerated emotions may shape the interaction, and form and renew the social structures by challenging and transforming existing ones (Garfinkel, 1967; Koudenburg et al., 2017; Sacks et al., 1974). In this study, we focus solely on *appropriately* exaggerated emotional expressions, and examine such expression on several online platforms.

While the effect of "display rules" that signify normative behaviors in offline communication are well-documented, their effect in online communications received less attention, perhaps because such expression rules might be blurred. There are several reasons for this lack of clarity. First, online communication filters out a large part of the nonverbal communication cues (Walther, 1996, 2011; Xu & Liao, 2020) on which display rules rely, making it difficult to follow these rules. Second, as behavioral norms might differ between offline and online environments (Mesch & Beker, 2010; Sibona & Walczak, 2011), it is

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possible that such differences also exist across diverse online environments.

Therefore, the current study focuses on differences between social network applications (SNA) regarding the norms of expressing emotional responses to posts or messages that are published within each SNA. We are especially interested in perceptions of exaggerated responses, namely when and why these expressions are perceived to be the behavioral norm and when and why they violate the norms. We begin by discussing features of online communication that encourage exaggerated emotional responses. We contend that displaying exaggerated emotions may become the norm in some SNA, but may be less accepted in other SNA. Furthermore, we suggest that SNA may differ in the level of exaggerated emotional response due to differences in norm formations across those platforms. In Study 1, we test reported differences of exaggeration across SNA, and explore the relative contribution of potential factors that may affect these perceptions. In Study 2, we test a model of possible reference points on which people rely during judgments of online exaggerated responses.

1. Theoretical framework

Exaggerated emotional response may become the norm in SNAs, due to inherent features of the online medium. Online communication is characterized by a limited channel that filters out the otherwise rich communicative cues that afford mutual understanding (Sproull & Kiesler, 1986; Walther, 1996, 2011; Xu & Liao, 2020). When individuals use text-based communication channels such as texting, emailing, posting, or replying on SNA, they do so in the absence of nonverbal cues such as facial expressions, nonverbal vocal messages, gestures, and even posture. These nonverbal signals may be crucial for interpreting the meaning of the verbal message. Nonverbal *emotional* expressions are also filtered out (Derks et al., 2008), as they are often expressed via nonverbal means. Many studies have tested the nonverbal aspects of emotional expression (for a review see Cordaro et al., 2018). These studies have shown that the nonverbal features of emotional expression are essential for understanding the underlying conveyed affect. Furthermore, the expression of emotion may be intensified or weakened by nonverbal cues (Lee & Wagner, 2002), and thus their absence may decrease the fit between the intention and the interpretation of the message.

Text-based interlocutors partly overcome the lack of nonverbal cues by using textual paralanguage cues (Luangrath et al., 2016). Emoticons and emojis commonly help to clarify the meaning of messages (Bai et al., 2019; Derks et al., 2008; Walther & D'Addario, 2001), including their emotional intentions. An alternative way to fill in nonverbal communication is to use written and typographical cues (Burgoon & Hoobler, 2002; Kalman & Gergle, 2014). These cues may help convey emotional reaction by using extraordinary words, unconventional typographs (e.g., capital letters, letter repetitions), and repeated punctuations or series of exclamation marks that emphasize words or sentences. For example, instead of replying to a happy post announcing a promotion at work by writing "congratulations", one may respond by writing "CONGRATULATIONS!!!!!", thereby intensifying the excitement that one is trying to convey.

Thus, we suggest that exaggeration may be prevalent in SNA first and foremost because communicators attempt to fill in the filtered out cues. Accordingly, a report of events in SNA does not merely express happiness or sadness, surprise, or boredom. Instead, events are often described as special, grandiose, exceptional, and extraordinary. They are bigger than life. Their sentiment is amplified. It stands to reason that exaggerated emotional expression becomes the norm in SNA communication because replying to exaggerated posts demands the same level of exaggeration.

The communication accommodation theory (Giles, 2016; Giles et al., 1987) posits that people often adjust their communication style (e.g., accent, pitch, speech rate, length of messages, use of specific words or phrases, register) during interactions to fit the style of their conversation partners, consequently enhancing similarities between them. Convergence of communication styles has been documented also in online communication (e.g., Crook & Booth, 1997; Gonzales et al., 2010; Postmes et al., 2000; Sassenberg, 2002; Scissors et al., 2008; Stocks et al., 2018; Tamburrini et al., 2015). Thus, when exaggerated emotion is expressed, it is expected that interlocutors will accommodate their emotional response and reciprocate in a similar level of exaggerated expression, subsequently establishing norms of emotional exaggeration.

The establishment of communication norms in online communities can also be explained by the Social Identity of Deindividuation (SIDE) model (Reicher et al., 1995; Spears, 2017). This model suggests that anonymous conversation, which is a prominent feature of text-based communication, emits depersonalization. Under these circumstances, communicators identify themselves and others in terms of group identities rather than as unique individuals. As a result, a shared social identity is amplified, serving as a critical factor that induces behavior (Lea, Spears, & De Groot, 2001). Most studies that tested the SIDE model focused on anonymity and group identity; however, the model may offer a framework to understand adoption of communication norms more broadly. For example, Bäck et al. (2018) tested language use in an online xenophobic forum. They found increased usage of plural ('we') and decreased frequency of singular ('I') over time, suggesting that participants established and adopted a linguistic norm that reflected the formation of the group's identity. In addition, they reported that individuals' linguistic style became increasingly similar to the style of the other members over time, as the communication accommodation theory predicts. Similarly, Peña and Hancock (2006) described a process of adherence to positive social conversation norms, and Rösner and Krämer (2016) reported a process of adherence to negative conversation norms. These findings indicate that online communities develop communication norms and that their members gradually adapt to them.

Different communication norms may be formed across diverse SNAs. Waterloo et al. (2018) tested norms of emotional expression in different online media platforms. They showed that expressing positive emotions is perceived as more suitable than expressing negative emotions across all platforms. However, they also documented differences between platforms. For example, expressions of negative emotions were considered most unsuitable on Instagram, whereas expressions of positive emotions were perceived as less acceptable on Twitter. Thus, each platform leads to the development of different communication norms. While Waterloo et al. did not examine emotional exaggeration, their findings may illustrate some boundaries regarding the acceptability of communication styles across SNAs.

Very few studies have examined interpersonal online exaggerations. A decade ago, McLaughlin and Vitak (2012) conducted a small sample qualitative study of Facebook norms, and found that exaggerated emotional expression was considered a violation of the norm. However, since then, the usage of SNA has increased dramatically (e.g., number of monthly active Facebook users grow from 1.01 Billions in September 2012 to 2.96 Billions in September 2022, see: https://investor.fb.com), and it is possible that the norms of expressing emotion on SNA have evolved and changed. Moreover, while McLaughlin and Vitak's (2012) study focused on negative exaggeration, most current interactions on SNA are positive (Waterloo et al., 2018). In environments that promote positive communication, negative exaggeration might be considered inappropriate, whereas positive exaggeration might be considered a building block of norm of solidarity when participants construct communication standards and follow them.

The current research explores emotional exaggeration and its underlying mechanisms. Our first aim is to fill the gap in describing the prevalence of such communication. Our second aim is to study differences in communication norms across diverse online environments and in relation to various prompts. The studies in this paper are designed to investigate a positive appropriate-to-situation exaggeration, as most interactions on SNAs are positive. Study 1 was designed to investigate

exaggeration of positive emotional expressions on four social network platforms. We examine self-reported exaggeration across different platforms, content formats, and privacy levels. To assess perceived emotional exaggeration norms, participants were asked to report their own exaggeration, as well as exaggeration by a familiar other. We assumed that self-report would be less useful in revealing norms than reports about a familiar other, as people tend to think more highly of themselves and thus may not acknowledge their own exaggeration. Study 2 investigates *why* responses are perceived as exaggerated, by examining to whom one compares oneself when deciding that a response is exaggerated. Specifically, in Study 2, participants saw a post and a response published on the same four platforms as in Study 1. They then indicated whether the presented response was exaggerated in absolute terms, and whether it was exaggerated in comparison to three reference points: their own responses, responses of a familiar other, or the social norms that govern the SNA. To understand what underlies the perception of a response as exaggerated, we examined which of these reference points predicted the absolute judgment. We were particularly interested in the effect of norms.

2. Study 1: exaggeration in SNA – when are responses exaggerated?

Study 1 was designed to test the elicitation of exaggeration across various SNAs. To examine this phenomenon in depth, we explored several factors that may affect exaggeration. We were primarily interested in the level of exaggerated emotional response which participants reported that they published. To assess these reports, we compared self-reports of exaggerated emotional responses and the perception of similar responses posted by familiar others.

Assuming self-other asymmetry bias (Jones & Nisbett, 1972; Pronin, 2007; Pronin et al., 2004) and the tendency for self-favoring (Alicke, 1985; Hoorens, 1995), we predicted that

H1. Participants will report that they are less prone to emotional exaggeration on SNA relative to others.

Of particular interest is the difference in the average level of exaggeration reported for various SNAs. Such a difference may indicate that each SNA has unique norms. Since each SNA contains content of different formats (texts, pictures, or videos), we also asked about response to diverse types of content. It is possible that text is the least emotionally engaging, then pictures, and then videos (Glasford, 2013; Yadav et al., 2011; for a review see Jajdelska et al., 2019). Assuming that emotional engagement elicits intensified emotional reactions, we hypothesized that

H2. Users will respond with fewer exaggerations to text than to pictures or videos.

The presence of an audience may also affect the expression of emotion (Fridlund, 1991), especially on SNA in which the audience in public communication may be diverse and difficult to imagine (Litt & Hargittai, 2016). Furthermore, Bazarova (2012) found that participants rated a message as less inappropriate when it was communicated in private than when communicated publicly (see also Ziegele & Reinecke, 2017). Online environments afford different communication channels. These range from one-to-one personal messaging, semi-private messaging, in which a one-to-one communication takes place in a group context, to many-to-many public or group conversation. The level of exaggeration may depend on awareness of the number of recipients, such that

H3. People will respond with greater exaggeration as the conversation is seemed more private (i.e., will exaggerate more to content published in one-to-one setting than in the presence of others or in one-to-many group contexts).

We compared four applications that differ in the communication

channel that they afford,[1] as well as one-to-one (in private or in group context) messages to one-to-many messages. In email and WhatsApp this distinction appears in the private vs. group mode of communication. For Facebook in Instagram[2] we compared responses to a friend's post and responses to public posts. We assumed that posting on a friend's feed is perceived as more private and is similar to one-to-one communication, although both can be seen by others.

To summarize, Study 1 tests the level of exaggeration across four online environments to reveal differences in communicative norms. We examine reported self-exaggeration and exaggerations produced by others, in response to various formats and in different levels of perceived privacy.

2.1. Method

2.1.1. Data availability and ethical considerations

The data underlying this article will be shared upon request from the corresponding author. The two studies received Institutional Review Board approval.

2.1.2. Participants

Power analysis using G*Power revealed that at least 180 participants are required. One hundred and ninety-seven students from a large Israeli university (83% women, age range 19–84, mean age = 29.4, SD = 9.47) participated as part of their requirements toward a BA degree in psychology or education. Students were invited to participate in a study about "the ways in which emotions are expressed online". Inclusion criteria specified that participants must have used at least one of the tested platforms in the study (Facebook, WhatsApp, email, or Instagram). However, the vast majority of participants reported using more than one platform, and none of the participants was excluded based on this criterion. The result of a post-hoc power analysis showed that the study had sufficient power (0.928).

2.1.3. Stimuli and procedure

Study design. The study used a within-subject design in which participants were asked about the level of exaggeration of themselves and of a familiar other when responding to content that was uploaded to four online platforms (Facebook/WhatsApp/Instagram/email), in different formats (text/picture/video), with two privacy levels (private/group). Instructions included an opening sentence: "Please refer to the frequency with which the following happens to you while using Facebook [WhatsApp/Instagram/email]". Then, we addressed participants by saying: "When I respond, press "like", or use emojis in response to a text message [picture/video] posted by a friend [in a group], my response might be stronger relative to what I truly feel at that moment".

Platforms. We studied four platforms: Facebook, Instagram, email, and WhatsApp (which is frequently used for instant messaging in Israel). Table 1 presents the reported frequencies of using the four platforms, which were divided into reading posts ('Read') and responding to them (in texts or in "likes"; 'Respond'). As can be seen, participants read messages on WhatsApp, Facebook, and email very frequently, and tended not to check posts on Instagram so often. On WhatsApp, participants were very responsive, whereas on the other platforms reported response rates were relatively low.

Responder. The questionnaire had two parts. One related to the *self* and the other related to a *similar and familiar other* that was defined as "someone you know well personally, who is at the same age and gender as you, and uses the Internet as you do". At the beginning of the *familiar*

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[1] Email and WhatsApp are not "classical" social networks. We included them because they are often used to communicate with groups of other users, and are therefore highly relevant to testing online communication norms.

[2] Facebook and in Instagram afford one-to-one private messaging, but these options were not tested while gathering the data.

Table 1
Frequencies (%) of reading and responding per platform.

	Facebook		Instagram		email		WhatsApp	
	Read	Respond	Read	Respond	Read	Respond	Read	Respond
Never	13.7	24.4	46.2	55.3	1.5	49.2	2.5	4.6
Less than once a month	3.6	6.1	3.0	5.1	0.0	7.1	0.0	0.5
About once a month	0.5	4.1	2.0	4.1	1.0	4.1	0.5	0.0
Few times a month	1.0	5.1	2.0	4.6	1.0	9.1	0.0	1.0
About once a week	0.5	6.1	3.0	6.6	5.6	4.6	2.5	3.0
Few times a week	8.1	15.2	8.1	5.1	13.2	7.6	0.0	4.1
Once a day	12.7	13.2	7.1	6.6	28.4	7.1	34.5	9.1
Few times a day	42.1	18.3	19.3	5.6	40.6	6.6	0.0	38.6
More than every hour	17.8	7.6	9.1	7.1	8.6	4.6	59.9	39.1

other part, we asked participants to name a person who fit this definition. This name appeared in all questions in all the conditions described below. The two parts were identical, except that when asking about the familiar other the questions referred to someone else. The two parts appeared in a counterbalanced order across participants, and so was the presentation order of the four platforms within each part.

Content format and perceived privacy. For each platform (except Instagram, see below) we asked six questions, two for each content format (text, picture, or video) that differed by perceived privacy level (private, public). In the *private message* condition, for each content format the item read "When I respond or press "like" to a text message [picture/video] posted by a friend, my response might be stronger relative to what I truly feel at that moment". In the *public message* condition, instead of "posted by a friend", we asked about "a message published in a group". Responses ranged from 1 = never to 7 = always (an "irrelevant" response was also allowed).

As noted above, we randomized the presentation order of self and other responders as well as the four platforms. However, to avoid confusion, the content formats within each platform were presented in a fixed order: text, picture, and then video.

Instagram has no group mode. Thus, instead of asking about responding to a message published in a group, we asked about responding to a message that appeared on a celebrity's profile or on a commercial profile, assuming that messages on such profiles are more similar to messages published in public, large, and diverse groups available on the other platforms. In addition, Instagram is a visually-based platform, oriented toward pictures and videos, while text is either presented as a photo, or appends to photos or videos. Either way, text is not a main feature in this platform. Thus in the Instagram conditions we asked only four questions (picture and video of a friend or picture and video of celebrities/commercial companies).

Control variable. We intended to control for *Sincerity* by using three items from the HEXACO-60 (Ashton & Lee, 2009). However, reliability was too low (Cronbach's α = 0.35) and therefore we did not use this measure when analyzing the data.

2.2. Results

We were primarily interested in the main effects of platforms, responder (self vs. other), content format, and perceived privacy level (private vs. public). We ran a factorial repeated-measures ANOVA to account for interactions as well. Given the absence of text in Instagram, we could not run a full factorial model. Therefore, we analyzed the results for Instagram separately, but ran an additional analysis on responding to *pictures* and *videos* on the four platforms. Table 2 presents the means of reported exaggeration in all conditions.

The comparison of responses for Facebook, WhatsApp, and email revealed a significant main effect of platform, $F(2, 222) = 25.529, p < .001$, partial $\eta^2 = 0.187$. Participants reported greater exaggeration on Facebook than on email ($p < .001$), and greater exaggeration on WhatsApp than on email ($p < .001$), as revealed by a post-hoc test using Bonferroni adjustment for multiple comparisons. No other differences

Table 2
Average (and SD) of reported exaggeration levels per platform, responder, content format, and privacy level.

Platform	Content	Private message		Public message	
		Self	Other	Self	Other
Facebook	Text	3.87 (1.74)	4.13 (1.77)	3.44 (1.66)	4.09 (1.70)
	Picture	3.82 (1.69)	4.29 (1.83)	3.46 (1.63)	4.12 (1.68)
	Video	3.72 (1.61)	4.19 (1.82)	3.38 (1.58)	4.01 (1.75)
WhatsApp	Text	3.97 (1.68)	4.32 (1.73)	3.76 (1.65)	4.20 (1.58)
	Picture	4.02 (1.57)	4.23 (1.69)	3.96 (1.65)	4.22 (1.55)
	Video	3.89 (1.62)	4.21 (1.68)	3.77(1.60)	4.17 (1.56)
Instagram	Picture	3.70 (1.78)	4.25 (1.97)	3.20 (1.66)	4.00 (1.93)
	Video	3.63(1.76)	4.33 (1.91)	3.07 (1.72)	3.86 (1.80)
email	Text	3.08 (1.67)	3.35 (1.78)	2.98 (1.61)	3.32 (1.73)
	Picture	3.23 (1.61)	3.65 (1.76)	3.20 (1.61)	3.53 (1.73)
	Video	3.27 (1.72)	3.70 (1.83)	3.18 (1.65)	3.50 (1.75)

between the platforms were significant. The effect of responder was also significant, $F(1, 111) = 9.180, p = .003$, partial $\eta^2 = 0.076$, implying that participants reported less exaggeration for themselves than for others, as the classical self-other bias predicts (*H1*). Another significant main effect was found for content format, $F(2, 222) = 5.609, p = .005$, partial $\eta^2 = 0.048$. A post-hoc analysis using Bonferroni adjustment for multiple comparisons showed that participants reported less exaggeration in response to text than to pictures ($p = .003$), a result that partially supported the emotional engagement assumption (*H2*). Last, there was a significant effect of perceived privacy, $F(1, 111) = 5.676, p = .019$, partial $\eta^2 = 0.049$. Participants reported greater exaggeration when replying to a friend's message (perceived private content) than to a public content (a message in group), suggesting that people may want to display emotions more "loudly" in a conversation that is perceived as more private in order to pass the medium's filter. At the same time, the possible presence of an audience that might be composed of unfamiliar strangers decreases the tendency to exaggerate emotions (*H3*).

Two interactions were significant, both involved platform as an independent variable. First, the platform effect was significantly moderated by content format, $F(4, 444) = 5.002, p < .001$, partial $\eta^2 = 0.043$. To understand this result, we tested the effect of format for each platform separately. Significant differences between content format were found for WhatsApp, $F(2, 362) = 4.037, p = .018$, partial $\eta^2 = 0.022$, for email, $F(2, 268) = 19.193, p < .001$, partial $\eta^2 = 0.125$, and for Facebook, $F(2, 306) = 2.493, p = .084$, partial $\eta^2 = 0.016$. While for WhatsApp and for Facebook reported exaggeration was significantly higher in response to picture than to video [Δ(picture-video): WhatsApp: .128, $p = .009$, and Facebook: 0.099, $p = .045$], in email the least exaggerated response was to text, which was significantly lower than the response to picture [Δ(text-picture): −0.228, p < .001] and to video [Δ(text-video): −0.252, $p < .001$]. In email, no difference was found between picture and video. Fig. 1 presents these findings.

The second significant interaction was between platform and perceived privacy level, $F(2, 222) = 3.182, p = .043$, partial $\eta^2 = 0.028$. Testing the difference between responding to a friend's post and
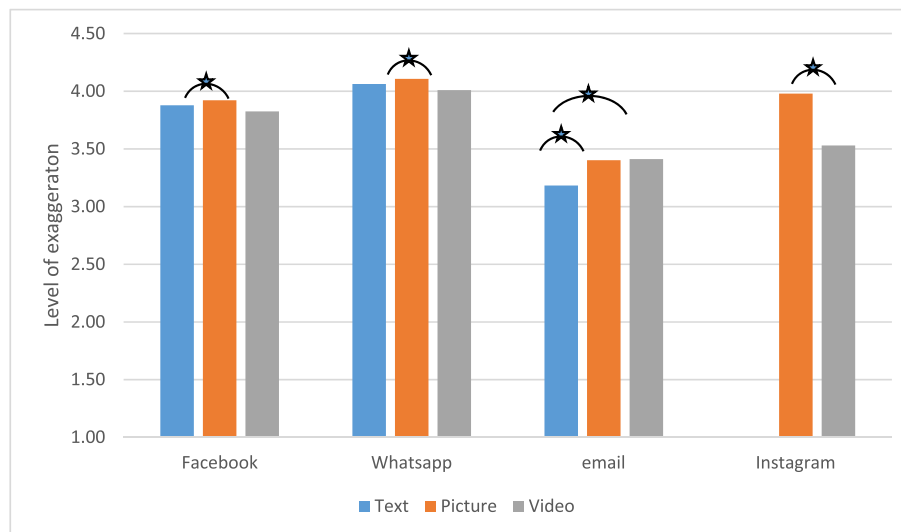
Fig. 1. Levels of reported exaggeration for the platform × content interaction (Instagram means are presented for reference). Asterisks mark significant differences within each platform.

responding to a post that was published in a group, separately for each platform, revealed that participants reported greater exaggeration when replying to a friend's message than when replying to a message posted in a group on Facebook, $t(194) = 5.124$, $p < .001$, Cohen's d = 0.37, but not on WhatsApp, $t(196) = 1.671$, $p = .10$, Cohen's d = 0.12, or on email, $t(188) = 1.468$, $p = .14$, Cohen's d = 0.11. A possible explanation is that participants know the audience of an email or a WhatsApp message much better than they know the audience of a Facebook group.

Since Instagram has no textual posts, we ran a repeated-measures ANOVA to examine the effects of responder, content, and privacy level separately for Instagram. The effect of responder was significant, $F(1, 103) = 14.752$, $p < .001$ partial $\eta^2 = 0.125$, with identical self-other bias found for all other platforms (*H1*). There was no significant difference between responding to a picture and a video. Last, perceived privacy level had a significant effect, $F(1, 103) = 17.505$, $p < .001$, partial $\eta^2 = 0.145$, revealing a higher level of exaggeration in response to a friend's post than to posts on profiles of celebrities or commercial companies, which is similar to the differences that were found for the other platforms (*H3*).

A complementary analysis examined all four platforms, responder, privacy level, and two content formats that appeared in all platforms – namely, picture and video, resulting in a 4 (platform) X 2 (responder) X 2 (privacy level) X 2 (content format) full factorial repeated-measures ANOVA. Table 3 presents the main effects and simple interactions (triple and quadruple interactions were not significant and are therefore not presented). All four main effects were significant, corroborating the previous analyses. The effect of platform resulted from a significant lower reported exaggeration in email relative to Facebook ($p = .02$) as

well as relative to WhatsApp ($p < .001$), as discovered by a post-hoc test using Bonferroni adjustment for multiple comparisons. The interaction between platform and privacy level was significant, and emerged from a significant difference between privacy levels (i.e., greater exaggeration in responding to a private message than to messages sent in group) found for Facebook $F(1, 159) = 24.603$, $p < .001$, partial $\eta^2 = 0.134$, Instagram, $F(1, 103) = 17.505$, $p < .001$, partial $\eta^2 = 0.145$, and email, $F(1, 138) = 5.587$, $p = .019$, partial $\eta^2 = 0.039$. This finding was not observed for WhatsApp, $F(1, 181) = 0.652$, $p = .421$, partial $\eta^2 = 0.004$. Fig. 2 presents all relevant interactions.

2.3. Discussion

The main goal of Study 1 was to examine the level of exaggerated emotional response on different platforms. We found small but significant differences across platforms that may reflect divergent communication norms developed for each platform. The highest level of exaggeration was reported in WhatsApp and in Facebook, and the lowest level was reported in email. Facebook, and the group-mode of WhatsApp are more socially-oriented than Instagram and email, because they were designed to encourage group communication. Given the similarities in the sociotechnical affordance of these platforms (at least in terms of conversation), people have developed more pervasive norms of exaggerated emotional expression within them.

The main effect of platform was moderated by two of the other variables that we tested – content format and perceived privacy level. The emotional engagement assumption suggests that users respond with greater exaggeration to more engaging content. Our data did not reveal this hypothesized pattern. Though pictures led to slightly more exaggerated response than texts, videos led to *less* exaggerated emotional responses than pictures. However, the interaction suggests greater exaggeration for pictures over video (and non-significantly over text) on Facebook, WhatsApp, and Instagram, which disappears in email communication. It is possible that the fact that pictures and video messages are less common in email relative to the other platforms eliminates the effect. It is also possible that since the introduction and fast dissemination of WhatsApp and other online communication platforms, emails now retain mainly to work-related purposes. Thus, the types of pictures and videos sent on this platform are different from those sent on the other three platforms.

Why do participants react with greater emotional exaggeration to pictures than to videos? Viewing a picture consumes less time and cognitive resources than watching a video, and thus video messages may

Table 3
Main effects and simple interactions of responder, platform, content format, and privacy.

|	df	F	p	partial h^2
Responder	1, 83	12.083	<.001	0.127
Platform	3, 249	7.258	<.001	0.080
Content format	1, 83	8.499	.005	0.093
Privacy level	1, 83	15.912	<.001	0.161
Responder X Platform	3, 249	2.585	.054	0.030
Responder X Content	1, 83	0.296	.588	0.004
Responder X Privacy level	1, 83	1.047	.309	0.012
Platform X Content format	3, 249	0.755	.521	0.009
Platform X Privacy level	3, 249	6.270	<.001	0.070
Content format X Privacy level	1, 83	0.792	.376	0.009
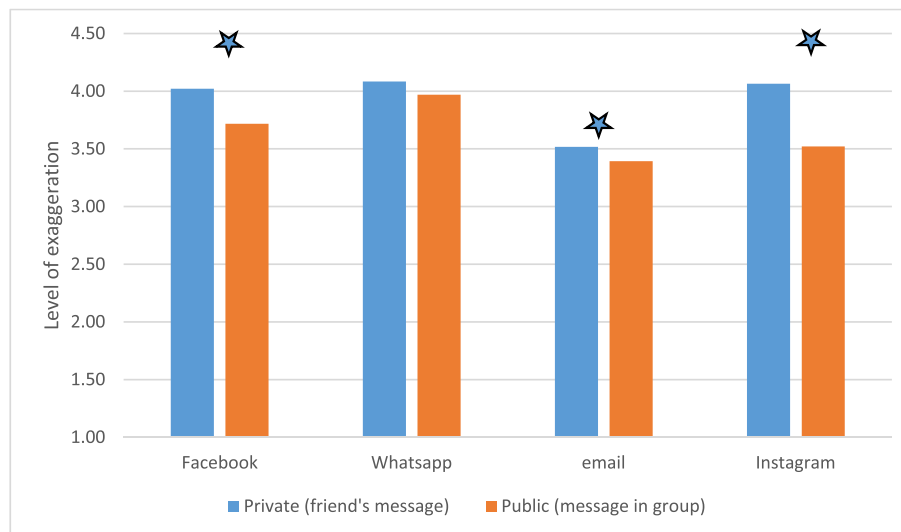
Fig. 2. The interaction between platform and privacy level. Asterisks mark significant differences.

require more mental effort, and demand more personal involvement. These psychological requirements may backfire when it comes to responding. Users may attenuate their response, simply because their resources have already been more depleted (Baumeister et al., 1998).

The other moderator variable is perceived privacy level. Generally, participants reported that they exhibited more exaggerated emotion when responding to a friend, either through one-to-one communication or in a group context relative to a message sent in a group. We suggest that exaggerating in response to a friend's message is normative on these platforms, and that it stems from the will to transmit emotions despite communication filters. Perceived level of privacy moderated the effect of the platform, such that greater exaggeration to a friend's message was found for Facebook and Instagram, but less so for WhatsApp and email. This difference may reflect normative rules that have been formed within these platforms, which are less apparent in WhatsApp or email conversations. The formation of these norms might be in part influenced by the amount of communication privacy that they afford. Prevalence of exaggerated responses to a friend in applications in which such communication can be seen by others may not be identical to exaggeration in applications that afford more privacy. Another possible explanation is that Facebook and Instagram may be seen as more leisure-oriented, while WhatsApp and email encompass diverse communication goals (with family and friends but also with people in the workplace or with official institutions). Last, this finding might reflect differences in group composition. Public communication on Facebook and Instagram involves an audience of strangers, while communication on WhatsApp and email generally involves familiar people. The communication apparent on WhatsApp and email may adhere to norms that attenuate exaggerated emotional expression, such as being more sincere and thus more accurate (with close friends and family), or being more formal (with co-workers).

Our results also replicate the classic self-other bias, showing that participants rated their own exaggeration as lower than the exaggeration of others. Self-other bias has been found for online behaviors such as deception (Caspi & Gorsky, 2006; Toma et al., 2018), risk vulnerability (Kim & Hancock, 2015), and detection of fake news (Corbu et al., 2020). We note that participants evaluated their own exaggeration below the scale's mid-point, while estimating the exaggeration of others as above this mid-point. This finding may validate the layperson perception that "everyone exaggerates their emotions while communicating online".

Taken together, Study 1 shows that platforms differ in terms of perceived emotional exaggeration. We attribute this effect to the differing norms that govern each platform. The results are in line with

Waterloo et al.'s (2018) reported norm differences across online platforms. However, the current study focuses on *exaggeration* of emotional responses rather than on the mere expression of emotions. As such, it goes beyond Waterloo et al.'s study. While they asked whether expressing emotions is acceptable, we asked to what extent people exaggerate this expression.

Study 1 suggests that exaggeration might be the norm in many online platforms, yet the roots of this effect are still unknown. Therefore, in Study 2 we look at online emotional exaggeration from a different perspective. Judging whether an emotional expression is exaggerated requires a reference point and a context. We thus attempt to define the perceived *source of exaggeration* by testing a model with three reference points with which participants can define whether a response is exaggerated. More specifically, we examine the role of *norms* in such judgments.

3. Study 2: judging exaggeration in SNA – test of three reference points that might underlie the feeling of exaggeration

How do we judge whether an emotional expression is exaggerated or appropriate? Similar to other social judgments, judgment of exaggeration most likely relies on processes of social comparison (Chambers & Windschitl, 2004; Festinger, 1954; Gerber, 2020; Schwarz & Bless, 1992). Clearly, such processes affect both online and offline behaviors (Haferkamp & Krämer, 2011; Latif et al., 2021; Vogel et al., 2014), but the current study focuses on the basic comparative process to better understand the role of communication norms across different SNA. Thus, in Study 2, we examined the reference points to which people compare a response in order to determine whether it is exaggerated or appropriate.

A reference point is any objective or subjective information against which the target can be evaluated (Mussweiler, 2003; Ostrom & Upshaw, 1968). We suggest that similar to other social judgment processes, judgments of emotional expressions rely on three major reference points (Festinger, 1954; Gerber et al., 2018): the *self*, the *other*, and the *social norm*. The self is the most accessible reference point (Schwarz et al., 1991), and it is used even when other reference points are available (Klein, 1997). Thus, it might serve as the prominent reference point in judgment of levels of exaggeration. The second reference point may be another person. People tend to base their comparative assessments and judgments on people who are close to them or on people with whom they are highly familiar (Festinger, 1954; Zell & Alicke, 2010). The third possible reference point

is social norms, which may be especially powerful in SNA. Since display rules are set against the group norms to which emotional expressions might be compared (Ekman, 1993; Hochschild, 1983; Matsumoto et al., 2008; Van Kleef et al., 2011), norms are inherently taken into consideration as a possible reference point in this kind of judgment.

Thus, to judge the level of exaggeration of emotional expressions, one may use a combination of the above three reference points, and may weigh them differently according to her or his subjective experience with each SNA. Study 2 will use a novel approach to examine which

reference point receives the highest weight in such a process. In other words, we ask what drives the decision that a response is exaggerated: our own responses, our friends' responses, or the social norm within the given SNA.

Given the difference in communication norms revealed in Study 1, we expect to find differences in the weight of each of the three reference points across platforms. Since platforms differ in the amount of their perceived privacy, we limited Study 2 to public or group communication. To judge that an emotional response is exaggerated, one needs to
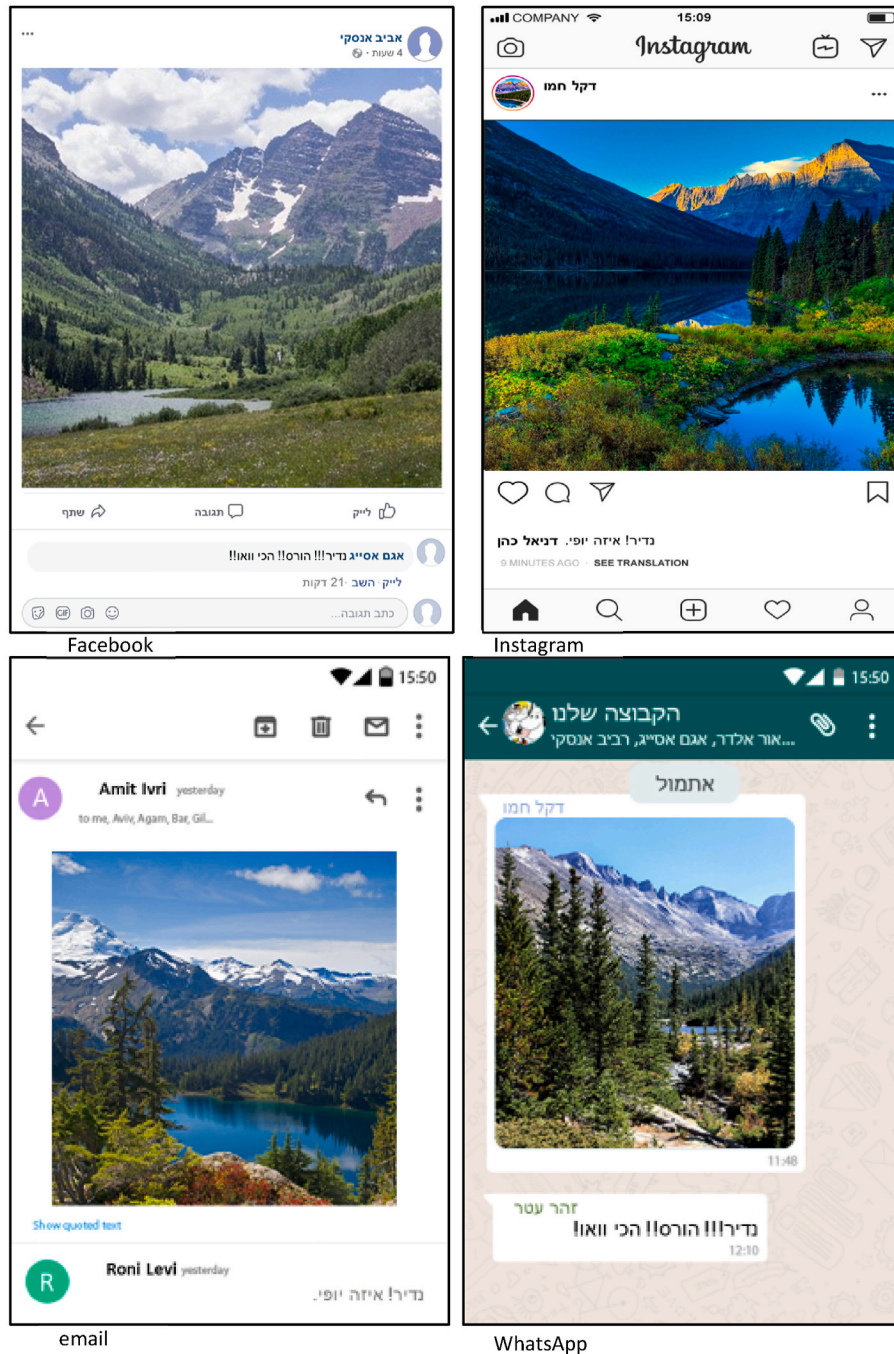
Note. The exaggerated response (Top left, Bottom right) said: "Exceptional!!! Mind-blowing!! Totally Wow! (literally: "the most wow")". The modest response (Top right, Bottom left) said: "exceptional! So nice".

Fig. 3. Examples of stimuli in Study 2.

consider it relative either to his or her response to a similar trigger, relative to a response that a familiar other would make to that trigger, and/or relative to the normative response to a similar trigger. Thus, we predict that

H4.   On SNA in which the norm allows exaggeration, participants will consider their own behavior and their familiar others' behavior as more important than the norm.

For instance, given that the norm of exaggeration is highest on WhatsApp, followed by Facebook, Instagram, and lowest on email, the weight of norms (compared to the self and the other person) in judging exaggeration will reverse that order and will be lowest on WhatsApp and highest on email (assuming that a response will be judged as more exaggerated if the norm is not to exaggerate emotional response).

3.1. Method

3.1.1. Participants
Data were collected from 875 students of a large Israeli university (68% women, age range 17–64, mean age = 30.0, SD = 8.99). Of them, 408 filled the questionnaire in person before the first COVID-19 lockdown, and 467 filled it several months later in an online survey. Participation was part of the requirements of an undergraduate degree in psychology or education. We tested the differences between in person and online participation. None of the variables differed across participation mode, and participation mode did not interact with any of the variables. Thus, the analyses reported below include both groups. Participants were randomly assigned to one of four conditions (a between-subjects design, see below), however due to a technical problem in the first days of administration, allocation to one condition (Facebook) was missed, resulting in an unequal number of participants in each condition.

3.1.2. Stimuli and procedure
Participants were asked whether they used each of the following online platforms: Facebook, WhatsApp, Instagram, and email. Then, they were allocated to one of the four platform conditions. If they did not use one or more of the platforms, they were allocated to one of the platforms that they reported using. One-hundred and 54 participants (17.6%) reported that they did not use Facebook, 19 (2.2%) reported that they did not use WhatsApp, and 297 (33.9%) reported that they did not use Instagram. Everyone used email.

The experiment had three parts. In the first part (hereafter *Absolute* judgement), participants were presented with three pictures of mountains and were asked to judge the response that was posted below the pictures (see Fig. 3 for examples), using a Likert-type scale, in which one end related to "a highly exaggerated response" (1) and the other end to "a highly compatible response" (5). Two pictures were accompanied by a *modest* positive emotional response and one by an *exaggerated* positive emotional response. As shown in Fig. 3, the pictures and responses were presented as they appear in the relevant application. To increase the saliency of group mode communication, for WhatsApp and email we added the names of multiple recipients. To increase ecological validity, all the names were common Israeli names.

The second part was a filler task, in which participants had to fill out six decision tasks. These tasks were presented as part of a study that developed a new questionnaire. In this part, participants saw pairs of different features of online networks (e.g., a 'share' symbol, font types) and were asked to select the alternative that they liked better. To extend the time interval of the filler task, we imposed a 20-s delay between presenting each stimulus and the participant's decision. This filler task was used to decrease a potential carryover effect between the first and third parts of the study, as participants might have perceived those parts as similar.

In the third and last part (hereafter *Relative* judgment), participants were presented with two pictures, one that was presented in the first part

(the target picture) and a new picture that they had not seen before. The new picture was always shown first, to introduce participants with this part of the questionnaire as well as to mask the fact that the second picture had already been presented in the first part of the study. Participants were asked to judge whether the response below the picture is exaggerated relative to (a) their own putative response (*self* reference point); (b) responses of other users of the application (norm reference point); and (c) a friend who uses the application to the same degree as the participant (*other* reference point). The scale of the relative judgments was identical to the scale of the absolute judgments. The combination of pictures and response types (exaggerated vs. modest) was counterbalanced across participants.

3.1.3. Analytical plan
As done in previous research of absolute and relative judgments (Klar & Giladi, 1999; Price et al., 2002; for more details of such analyses see Chambers & Windschitl, 2004), we used a regression analyses to test which of the three reference points (self, norm, or other) contributed to judging that a response was exaggerated. We regressed all three reference point judgments to a given target picture in the *relative* part on the equivalent judgment in the *absolute* part. We used platform as a moderator variable in this regression. Such an examination allows us to directly investigate what sort of comparison underlies respondents' own attributions of exaggeration.

3.2. Results

3.2.1. Differentiating modest and exaggerated responses – a manipulation check
To confirm that responses for the target picture were indeed perceived as exaggerated, we first compared exaggeration scores for exaggerated and modest responses, as collected in the absolute judgment part. We averaged exaggeration rating scores for the two modest responses, and compared this score to that given to the exaggerated response. We then conducted a two-way mixed ANOVA with response type as a within-subject factors (modest, exaggerated), and platform as a between-subject factor (Facebook, WhatsApp, Instagram, email). This analysis revealed a significant effect of response type, $F(1, 871) = 795.01, p < .001$, partial $\eta^2 = 0.477$. As expected, exaggerated responses were perceived as more exaggerated (M = 3.22, SD = 1.37) than were modest responses (M = 4.48, SD = 0.78). There was neither a platform effect, $F(3, 871) = 0.58, p = .464$, partial $\eta^2 = 0.003$, nor a significant interaction, $F(3, 871) = 0.50, p = .682$, partial $\eta^2 = 0.002$. Mean scores (and SDs) are presented in Table 4.

3.2.2. Reference points in different platforms
A linear regression examined the reference points on which participants rely when judging emotional exaggeration, and possible moderation by platforms. Predictors included the three reference points (self, norms, and other), platforms as a dummy variable, and the interaction between reference points and platforms. The absolute judgment served as the dependent variable. The model was significant, $F(7, 874) = 66.974, p < .001$, and accounted for 35.1% of the variance. Relying on the self as a reference point was significant ($\beta = 0.484, p < .001$) and so was relying on norms ($\beta = 0.211, p < .017$). There was no significant effect of the other reference point, the platforms, or the interaction

Table 4
Means and SDs of exaggerated and modest responses across the four platforms.

	Modest responses	Exaggerated response
Facebook (n = 202)	4.53 (0.67)	3.32 (1.34)
WhatsApp (n = 223)	4.48 (0.78)	3.18 (1.36)
Instagram (n = 226)	4.44 (0.76)	3.23 (1.41)
email (n = 224)	4.42 (0.83)	3.16 (1.38)

Note. Lower scores reflect greater exaggeration.

between reference points and platforms. Thus, judgment of online emotional exaggeration relies on the perception of one's own putative responses, as well as on the perception of the norm. Contrary to *H4*, the lack of a significant interaction between reference points and platform suggests that participants rely on themselves to the same extent on all platforms and take established communication norms into consideration as well.

Since we are particularly interested in possible differences in norms across platforms, we further examined the difference in mean ratings of exaggeration on the normative reference point across platforms, as measured in the *relative* judgment part. A one-way ANOVA revealed a significant effect of platforms, $F(3, 875) = 15.084$, $p < .001$, partial $\eta^2 = 0.049$. The response was judged as more exaggerated compared to the social norm on email (Mean = 2.68, SD = 1.40) than on all other platforms (Facebook M = 3.14, SD = 1.32; Instagram M = 3.42, SD = 1.26; WhatsApp M = 3.15, SD = 1.31) as revealed by a post-hoc test with Bonferroni adjustment for multiple comparisons (all p's ≤ 0.001). There was no effect of platform on mean ratings on the self and on the other reference points. In both cases, the emotional response was judged as exaggerated relative to one's own responses and relative to others' responses, regardless of the platform on which it appeared. Thus, the same response is perceived as more exaggerated relative to the norms that govern email communication, but this pattern is less apparent when tested against the accepted norms of the other platforms. At the same time, there was no evidence for the effect of the platform on judgments of exaggeration relative to the participant's own communication style and relative to the communication style that characterized a specific other.

3.3. Discussion

Study 2 has two important findings. First, we found that participants rely on two reference points when they judge exaggeration in online communication. These reference points include the self (i.e., the emotional response was perceived as exaggerated relative to one's own response) and the norms established in each platform (i.e., the emotional response was perceived as exaggerated relative to the way in which other users would react on the relevant platform). A specific friend who uses the application similarly does not add to the judgment of online emotional exaggeration. Second, we found that exaggerated responses were judged as more exaggerated relative to the communication norms of email than relative to the norms on the other platforms.

The finding that emotional exaggeration on email is less normative than on other platforms is not surprising. Study 1 showed that participants consider exaggeration on email as less suitable to the situation. Furthermore, as noted earlier, Facebook and Instagram had been inherently developed as social networks. The possibility of private communication on these platforms was introduced only later on. WhatsApp may stand in between these two ends. On the one hand, it was developed as an instant messaging platform for one-on-one communication, just like email. On the other hand, it allows group communication, added after private messaging, and this feature is highly prevalent, at least in Israel (Malka et al., 2015; Rosenfeld et al., 2018). It is possible that in that sense, group conversation norms on WhatsApp are more similar to other SNA norms, including exaggeration of emotional expression.

Email filters social cues of conversation at least as much as other platforms, if not more. However, we suggest that since most communication on this medium is done in person rather than within a group, and since its group communication relates primarily to work, exaggeration of emotional communication has not become a conversation norm on email. Even when a message is sent to a group of users, most of the time this is an ad-hoc group, and features that increase group saliency are either absent or minimal. Thus, the conditions that enhance group identity on platforms such as Facebook do not apply to email and do not lead to the development of the exaggeration norm on email communication.

4. General discussion

This research shows that exaggerated emotional communication is the norm across different SNAs. Moreover, we found small but significant differences between communication platforms, which we attribute to the conversation norms that define each medium. Content format and level of perceived privacy in which the message is published moderate the effect of platform. Exaggeration is reported more often in response to pictures than to videos, and more often when replying to a friend's post than to a message posted in group. Additionally, we showed that judgment of exaggerated emotional response relies on two sources. To determine whether a response is exaggerated, people compare the response to responses that they would have posted (self reference point) as well as to responses that are common in each platform (norm reference point).

We offer a two-step model to explain the prevalence of exaggerated responses in SNA. It suggests that since paralinguistic cues are filtered out, users need to amplify their emotional statements to convey their feelings. Exaggerated emotional messages receive exaggerated responses that aim to converge type of communication. Consequently, intensified emotional expression becomes the norm, and other users subsequently adhere to these norms.

4.1. Sources of online emotional exaggeration

Conveying an emotional state is an important part of human communication. Since the emergence of written communication, and in its advanced form – via text-based online communication – much effort is devoted to transmit emotions. People can explicitly express their feelings in text, but sometimes the medium does not afford full transfer of feelings (Derks et al., 2008). We suggest that users of written communication cast doubt on their ability to convey their exact feelings through online media, and therefore they intensify their expression, and the result is an exaggerated emotional communication.

Evidently, text-based communicators are aware of the limitations of the online platform, and compensate it by using different paralinguistic cues. These cues include emoticons and emojis, non-conventional typography, and also, as suggested in the current study, explicit exaggeration of emotional expressions. As recently showed, people attribute emotional states to unintentional email typos (Blunden & Brodsky, 2021). That is, they look for information regarding the sender's emotional state even when it was not intended to be displayed. Thus, people compensate for the weak affordance of communicating emotion online and search for emotion even when it is not explicitly expressed. If we assume that interlocutors consciously and deliberately consider the weaknesses of the medium, it may explain why they use tactics such as exaggeration to overcome these limitations.

Once exaggerated expressions are posted, they are reciprocated by exaggerated response, in a process that leads to the establishment of conversation norms. Such practices are expected in groups whose members have an equal status, and they are affected by the saliency of the group, as suggested by both the communication accommodation theory (Giles, 2016), and the social identity model of deindividuation (Spears, 2017). In the current study, we related to a very broad group, defined by all users of a specific platform. However, the boundaries of a group and its definition are complicated. Thus, it is possible to find differences in behavior even *within* each platform, depending on the saliency of a specific group (e.g., Gonzales et al., 2010; Postmes et al., 2000; Sassenberg, 2002). Testing such differences in exaggeration of emotional expressions within groups on any given platform was beyond the current study and deserves future research.

Adhering to the norm of exaggeration of emotional expression is thus a result of the limitations posed by the communication channel, the human desire to communicate emotions and to know the emotional state of the communication partner, and the constituted norms that define specific communication platforms. We note that the current study

focused on the *intensity* of expressing positive emotions rather than on the *content* of the emotions, which may moderate the effect of the platform. Studies of emotion contagion have shown that it occurs online (Goldenberg & Gross, 2020). Furthermore, positive emotions are contagious more than negative emotions (Kramer et al., 2014), and they seem to be perceived as more appropriate in online communication (Waterloo et al., 2018), which suggests that valence may moderate exaggerated expression and the level to which such exaggeration becomes the norm. Future studies should test these ideas further.

Additionally, exaggerated responses might be appropriate (exaggeration of a relevant and accurate emotion, for instance, expressing extreme sadness when missing the train), or inappropriate (when the exaggerated emotion is inaccurate, for example, when expressing happiness during a funeral). While this study only focused on appropriate exaggerated responses, this sort of exaggeration may also moderate the platform effect.

4.2. Limitations

A first limitation of the current study is that we tested perceptions (Study 1) and impressions (Study 2), rather than actual exaggerated behavior. Second, we tested only four SNAs. Expanding the scope by testing applications such as Twitter, LinkedIn, TikTok, or Youtube may expose other norms of emotional expression. Third, we did not test potential moderators of perceived exaggeration, such as gender (Shields, 2005), cultural background (Safdar et al., 2009), or personality traits (Kapoor et al., 2021). Future studies will have to test adherence to norms of emotional expression experimentally, extend the media under examination, increase the number of participants to assure better representativeness, and include potential moderators. As mentioned above, it may also be worthwhile to test positive versus negative emotional exaggerations, as well as appropriate versus inappropriate exaggeration. We believe that it will also be interesting to examine controversial stimuli, whose content might mix exaggerated and non-exaggerated, appropriate and inappropriate responses.

The current research focuses on revealing the general mechanism underlying exaggerated responses in online environments. Future research should also examine whether other factors affect the judgement of online content as exaggerated. For example, people may respond differently to negative versus positive content (Relling et al., 2016), to selfie versus not-selfie photos (Hartmann et al., 2021), or even when responding from different devices (Melumad et al., 2019).

To sum, exaggerated responses are prevalent in online communication and are recognized as normative by users of various platforms. On the one hand, this phenomenon may be restricted to written communication presented on online platforms. On the other hand, such communication norms may influence offline communication as well, lower the threshold of accepted and suitable emotional expression in daily spoken discourse, and subsequently change conversation norms. Once such processes occur, we may witness divergence in communication, so that online conversations will require learning of the "online language" and adjusting to it. However, convergence of online and offline communication practices (Bolander & Locher, 2020) may result in adoption of online communication norms in offline relationships. Such communication practice convergence may develop a society in which people constantly exaggerate their feelings, and are detached from their true emotions. A positive implication of the current study may be based on the tendency of the participants to rate their own exaggeration as lower than that of others, coupled by the fact that judgment of exaggeration was based to a large extent on a comparison to oneself. Taken together, these results may suggest that people frequently perceive a great part of online communication as exaggerated but perhaps do not wish to exaggerate themselves. Being aware of the level of exaggeration in online communication may help stop the vicious circle that increases exaggerated emotional expression.

Credit author statement

Avner Caspi and **Shir Etgar** equally contributed to all stages of this research.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chb.2023.107818.

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