



Your post is embarrassing me: Face threats, identity, and the audience on Facebook



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ARTICLE INFO

Article history:

Received 12 December 2016

Received in revised form

19 February 2017

Accepted 13 March 2017

Available online 16 March 2017

Keywords:

Embarrassment

Face threats

Other-generated disclosures

Identity

Facebook

Social media

ABSTRACT

While Facebook is a popular venue for sharing information about ourselves, it also allows others to share information about us, which can lead to embarrassment. This study investigates the effects of shared face-threatening information on emotional and nonverbal indicators of embarrassment using an experiment ($N = 120$) in which pairs of friends posted about each other on Facebook. Results show that face-threatening information shared by others produces a powerful emotional and nonverbal embarrassment response. However, it is not the content of the face-threatening post that produces this effect. Rather, the level of embarrassment depends primarily on whether that information violates the individual's identity and if they perceive that unknown members of their audience can see it. In response, individuals were most likely to joke about the post, although those who were most embarrassed were more likely to delete it. These results inform our understanding of how the process of embarrassment works online. The emotional embarrassment response is similar to offline, but is affected by the features of these sites, such as a large, invisible audience, and the need for ideal self-presentation. This finding has important implications for treating online social networks and their effects to be as "real" as those offline.

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1. Introduction

Online social networks such as Facebook offer a space for users to disclose information about themselves. However, they also allow friends and contacts to disclose potentially embarrassing or face-threatening information about users that can be visible on the users' profiles, or otherwise linked to their identity on the site. These online threats to self-presentation can occur in a variety of situations, ranging from cyber-bullying to more minor episodes that can nonetheless have a significant impact on one's identity. Recent research on face-threatening Facebook posts by users' friends or contacts further revealed many types of embarrassment experienced by users due to others' posts about them, such as unflattering photos or broad revelation of information intended for a narrower audience (Litt et al., 2014; Wohn & Spottswood, 2016).

While face threats have been documented online and have clear effects (Litt et al., 2014; Wohn & Spottswood, 2016), this work has

largely been retrospective. To our knowledge, no experiments have examined these processes in real time, so we know little about the details of how online face threats occur in real time, how people react to them, and how people take action to respond. We seek to understand how embarrassment from online face threats is experienced, using a laboratory experiment to focus on the emotional and nonverbal effects of face-threatening information shared by others on Facebook.

2. The process of embarrassment

Embarrassment is a short-lived emotional and psychological response to a discrepancy between one's idealized role-identity and one's presented role-identity (Singelis & Sharkey, 1995). Edelmann (1985) mapped the process of social embarrassment across a wealth of data and models on the causes, experience, and responses to embarrassing experiences. First, the process starts with the assumption that individuals are aware of and trying to follow a particular set of social rules. As part of this effort, individuals attempt to manage others' impressions of them via selective self-presentation of information about themselves

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(Schlenker, 1980). However, this self-presentation can be challenged by others (Higuchi & Fukada, 2008). Thus, the process of embarrassment is triggered when a disruption of social routine (e.g., a secret being revealed about the individual) creates an undesired impression of a person. These disruptions tend to fall into one of five categories of embarrassing events: awkward acts, violations of privacy, forgetfulness, criticism, and image appropriateness (Sharkey & Stafford, 1990).

Next, an awareness of this discrepancy draws attention to the target. Being the center of attention is a key situation that individuals find embarrassing, along with committing a faux pas, and threatening another's social identity (Sabini, Siepmann, Stein, & Meyerowitz, 2000). This attention highlights the threat to the target's desired identity in relation to others, another key element of inducing embarrassment. Singelis and Sharkey (1995) note the role of self-construal in embarrassment, or one's thoughts, feelings, and actions about the self as related to others. Those with higher interdependent self-construal show an increased susceptibility to embarrassment.

Finally, the presence of an audience, real or imagined, makes the individual aware that this discrepancy in self-presentation is visible to others. Most models of embarrassment, while addressing various causes, assume that an audience is a necessary condition for embarrassment (Manstead & Semin, 1981; Modigliani, 1971; Sugawara, 1992). Robbins and Parlavecchio's (2006) unwanted exposure model gets to the root of what makes any situation embarrassing: the revelation to an audience of something that one prefers to keep hidden. Embarrassment caused by others is particularly influenced by the perception of negative social evaluation (Withers & Sherblom, 2002), and by one's relationship to the audience (Singelis & Sharkey, 1995). Onlookers may even experience vicarious embarrassment when witnessing threats to another's social integrity (Müller-Pinzler, Rademacher, Paulus, & Krach, 2016).

In response, the individual will experience a feeling of embarrassment, characterized by both emotional and nonverbal responses. Embarrassment is emotionally unique from other negative emotions, such as shame or guilt (Keltner & Buswell, 1997). Embarrassment is also characterized by specific nonverbal responses, such as decreased eye contact (Modigliani, 1971), increased smiling (Edelmann & Hampson, 1981), speech disturbances (Edelmann & Hampson, 1979) and laughter (Fink & Walker, 1977; Kreifelts et al., 2014; Sharkey & Stafford, 1990). Once embarrassed, an individual will engage in "facework," or attempts to minimize the negative effects of the situation that caused embarrassment (Cupach & Metts, 1994), using a variety of protective and defensive communication strategies (Petronio, 1984). Response tactics include excuses, justifications, apologies, remediation, avoidance, aggression, mitigation, correction, and humor (Cho & Sillars, 2015; Fink & Walker, 1977; Metts & Cupach, 1989).

2.1. Embarrassment on Facebook

Edelmann's (1985) proposed process may play out similarly on Facebook. The effects of embarrassment on Facebook, however, may be exacerbated by the features it provides for self-presentation and content sharing. Individuals work to manage favorable impressions on Facebook as well as offline, engaging in selective self-presentation (Walther, 2007) by controlling what information is displayed to whom (Child, Duck, Andrews, Butauski, & Petronio, 2015; Christofides, Muise, & Desmarais, 2009). By protecting their information, users engage in communication boundary management, putting up a protective boundary to regulate the way they communicate to others (Petronio, 1991). For instance, high-intimacy disclosures are not considered appropriate when

publicly posted on Facebook (Bazarova, 2012). Individuals generally refrain from making such disclosures on Facebook, by self-censoring posts before they are made (Sleeper et al., 2013), or by using strategies such as "vague-booking" (Child & Starcher, 2016). Yet, 23% of Facebook users have made posts they later regret because they revealed too much or the wrong kind of information (Wang, Leon, Norcie, Acquisti, & Cranor, 2011).

Facebook also enables users to share content such as photos or status updates about their contacts, including information those contacts may not have chosen to reveal about themselves. We refer to these as "other-generated disclosures," and they are important because they can reveal key information about individuals that comprises their identity, perhaps even more so than the content they have chosen to reveal or share about themselves (Walther, Van Der Heide, Hamel, & Shulman, 2009). Sometimes this information may be in contrast to information users share themselves and could be embarrassing or "face-threatening" (Cupach & Metts, 1994).

Embarrassment due to face-threatening, other-generated disclosures on Facebook is not uncommon. About 21% of individuals report having been embarrassed by face-threatening posts made about them online by someone else (Best, Taylor, & Manktelow, 2015). This indicates that while individuals may manage their own privacy boundaries on the site, they do not necessarily coordinate these boundaries with those of their Facebook friends (Fox & Moreland, 2015). These face-threatening other-generated disclosures violate communication privacy boundaries, which can create turbulence in the relationship between the discloser and the target (Fox & Moreland), and induce significant negative affect (Chen, 2015), such as embarrassment. Thus, in terms of embarrassment, we predict that:

H1. A Facebook post that contains face-threatening information will cause more embarrassment than one which does not.

As noted in the detailed list above, it is common for people to experience a variety of nonverbal responses to embarrassment in face-to-face interactions. Less is known about these types of responses to embarrassment in mediated environments, where the target is not physically present with the person embarrassing them. While no one is present to see the responses, they may occur automatically. Therefore, based on strong evidence for nonverbal responses in other settings, we predict that:

H2. A face-threatening post will lead to significant perceptible changes in a) eye, b) mouth, c) head, and d) body movements, as well as e) vocalizations linked to embarrassment.

We predict that the embarrassment felt from face-threatening posts on Facebook will be due to three key elements in Edelmann's (1985) process: The post's content, disruption of the target's identity, and the audience. As a result, the target will engage in a variety of mitigation strategies to reduce the impact of the embarrassing post.

2.1.1. Embarrassing content

Previous research (Litt et al., 2014) indicates that embarrassment caused by other-generated face-threatening posts fall into one of three categories: norm violations, ideal self-presentation violations, and association effects. Norm violations present information that would be acceptable to a certain sub-group of the target's network (e.g., close friends), but not to another sub-group (e.g., parents), such as drinking behaviors. Ideal self-presentation violations include posts in which information shared detracts from the target's ideal self-presentation. Association effects are those in which the target is associated with others' actions that may embarrass them (e.g., posting a link on the target's page about a

political issue with which they do not identify). These violations are representative of Edelman's disruptions of understood social norms, and are all likely to cause embarrassment. However, because research to date does not indicate which of these other-generated face-threatening posts on Facebook will cause more or less embarrassment, we pose the following research question:

RQ1. Will the effect of a face-threatening post on embarrassment vary by the type of face threat (norm violation, ideal self-presentation violation, or association effect)?

2.1.2. Identify effects

A face-threatening posts threatens the target's desired online identity in the same way that disruptions of social norms threaten one's identity in Edelman's (1985) process. Previous research on Facebook impression management indicates that others' impressions of and contributions to a person's profile have a strong influence on how that person is perceived (Van Der Heide, D'Angelo, & Schumaker, 2012; Walther et al., 2009). Even when individuals regret information they have posted online, the most common reason is that it does not represent who they really are (Stern, 2015). All three face threat types uncovered by Litt et al. (2014) hinge on concerns about self-presentation. These violations present incongruence with the target's identity, and the level of incongruence presented could diminish or magnify the effects of a face-threatening post. Therefore, we predict that:

H3. The less consistent a face-threatening Facebook is with the target's identity, the more embarrassing it will be.

2.1.3. Audience effects

Like in Edelman's (1985) process, the audience on Facebook plays a necessary role in embarrassment. Disclosure online is directly influenced by who is in the audience (Child et al., 2015; Hollenbaugh, 2010). On Facebook, the role of the audience is magnified because the target is not always cognizant of who is in their audience (Acquisti & Gross, 2006; Bernstein, Bakshy, Burke, Karrer, & Park, 2013). While audience size does not have a consistent effect on embarrassment (Eller, Koschate, & Gilson, 2011; Litt et al., 2014), having many Facebook friends can make users feel less control over their self-presentation (Brandtzæg, Lüders, & Skjetne, 2010). Another common concern with social media audiences is context collapse, or the combination of many diverse offline networks in one online network (Vitak, 2012). Those with greater concerns about control over their privacy tend to exhibit higher Facebook usage intensity, which may also mean they have larger or more diverse audiences (Jordaan & Van Heerden, 2017). In terms of other-generated disclosures, this greater diversity of the perceived audience leads to a greater severity of face threat (Litt et al., 2014). Therefore, we predict:

H4. A face-threatening post will be more embarrassing when the target perceives it to have greater audience diversity.

2.1.4. Strategies to mitigate embarrassment

On Facebook, it is common to block the friend who posted a face-threatening message (Peña & Brody, 2014), though unfriending may also occur, particularly for weak-tie contacts (Bevan, Ang, & Fearn, 2014). Facebook users also report engaging in interpersonal privacy management actions including "wall management" activities such as untagging themselves from another user's photo, and "conversant privacy," such as asking someone to change their profile photo if it includes them (Stutzman & Kramer-Duffield, 2010). Deleting the post, ignoring the post, or commenting on the

post with a variety of tactics previously defined are the most common strategies related to the post itself (Wohn & Spottswood, 2016). Given that on Facebook it is not as clear who has yet seen the embarrassing post, the simplest strategy may be to delete it. Given the norms of Facebook which discourage negativity (McLaughlin & Vitak, 2012), jokework is a more likely option for commenting on the post than excuses or apologies. Ignoring the post is the least-used strategy overall (Wohn & Spottswood), so may be used more in cases of milder embarrassment. In this study we focus on these wall management behaviors, and predict that:

H5. The more embarrassed the target feels by the face-threatening post, the more likely they are to a) delete the post or b) joke about it.

3. Methods

3.1. Participants

Participants ($N = 120$) were recruited in pairs through flyers posted at several locations at a mid-sized Midwestern university, which stated they could participate in "a study about how people manage posts on their Facebook page." To be eligible, the pair had to consider each other good friends, each be at least 18 years old, consider themselves regular users of Facebook, and post on Facebook at least once per month. The resulting sample was 81% female. Most pairs (70%) were female-female, while 22% were male-female, and eight percent were male-male. Participants' ages ranged from 19 to 26 years old ($M = 20.8$, $SD = 1.45$). The median number of Facebook friends was 775 (range = 100–2600, $SD = 421.58$), and most participants (78%) reported spending at least half an hour on the site each day. The sample size is typical of studies of this nature and offered adequate statistical power.

3.2. Procedure

Interested pairs of participants signed up for the study via email, and were included in the study if they met the eligibility requirements listed in the recruitment flyer. Participant pairs came to the research laboratory together. After consenting to the study, one participant was randomly assigned to a "confederate" condition ($n = 60$) and the other was assigned to be the "target" ($n = 60$). Confederates were further randomly assigned to one of three experimental conditions: Norm violation ($n = 18$), ideal self-presentation violation ($n = 17$), and association effects ($n = 25$). Gender pairs were evenly distributed across confederate conditions, $\chi^2(6, N = 60) = 9.40, p = 0.15$.

Participants were seated in front of computers in two separate rooms. The two rooms were identical except for a video camera set up in the target's room to record their facial responses. In both roles, the sequence of events included: 1) completing a brief questionnaire to collect demographic and Facebook use data (see below), 2) composing and posting a text-based Facebook status update about their partner, using their real Facebook accounts, and 3) completing a web-based questionnaire on screen beside their Facebook Timeline in which they scrolled down and answered questions about the 15 most recent Timeline posts in reverse chronological order, such that the final questionnaire items were about the post by their partner.

First, after completing the initial questionnaire, participants in the target condition were asked to post a short, friendly message on their partner's Timeline. This post appeared on their partner's actual Timeline. We did this so that each partner expected a post from the other, and the target was more likely to believe their partner's embarrassing post to be visible on their Timeline when it

appeared. Then, they completed the questionnaire about the last 15 posts on their Timeline, while the confederate was instructed on their post.

Next, the confederate was instructed to compose a post that would likely embarrass their partner (the target). They were told the post would appear to the target as if it were visible on their Facebook Timeline, but would actually be visible only to the two of them. Visibility was limited by instructing the confederate to post the embarrassing content as a status update, and tag their partner so it would appear on the partner's Timeline. Before posting, they configured the privacy settings so the post was visible only to the target.

Confederates were provided with one of three possible instruction sets for the embarrassing post, intended to vary the type of embarrassing content they composed. Those assigned to the norm violation instructions were asked to “post something you know about your partner that you think would not be embarrassing to some of their friends, but would be embarrassing for other people in their Facebook network to know about.” Those with the ideal self-presentation violation instructions were asked to “post about something you know about your partner that you think would go against how they would like to present themselves online.” Those in the association effects condition were asked to “post about something that is not necessarily about your partner but you think they would be embarrassed to be associated with.”

Following the questionnaires, participants were debriefed together. The experimenter reassured the target that the embarrassing post was visible to nobody but the two partners, explaining how privacy was manipulated. Participants were then given time to delete the posts and restore their original privacy settings, and were paid for their participation.

3.3. Measures

3.3.1. Initial questionnaire

The first questionnaire measured Facebook use, network size, and demographics, including gender and age.

3.3.2. Timeline questionnaire

For each of the 15 most recent posts on their Timeline, as well as the experimental posts, participants completed a short questionnaire that measured their emotional reaction to the post, how well they thought the post fit their desired identity, and their sense of the post's audience.

3.3.2.1. Emotional reaction. Ten pairs of emotions experienced in reaction to the post were measured on five-point semantic differential scales. These items were adapted from previous measures (Bradley & Lang, 1994; Fuenzalida, Emde, Pannabecker, & Stenberg, 1981; Izard, Dougherty, Bloxom, & Kotch, 1974) to capture emotions that could occur specifically in response to a Facebook post. Factor analysis was conducted on the items to determine which emotions coincide with feeling embarrassed. Items were mapped to the factor on which they loaded at 0.6 or higher with no cross loadings of 0.4 or higher. This resulted in a two-factor solution. The embarrassment factor ($\alpha = 0.92$) loaded with embarrassed/self-assured, awkward/confident, flustered/calm, and nervous/relaxed. This factor was used as the dependent measure of embarrassment for analyses. The other factor ($\alpha = 0.89$) contained the items happy/sad, good/bad, excited/indifferent, and lonely/loved.

3.3.2.2. Identity consistency. We created a scale to assess how consistent the Facebook posts on the participant's Timeline are with their desired identity. While there are measures of related concepts of identity such as online identity management (Frunzaru

& Garbaşevschi, 2016), identity fusion (Jimenez et al., 2016), and independent/interdependent self-construal (Singelis & Sharkey, 1995), no previous scale addresses the extent to which posts on a target's profile represent their perceived identity. The scale consisted of six items: “This post shows my true personality,” “This post is a good representation of my identity,” “This post accurately portrays who I am,” “If someone saw only this post they would have the wrong idea about who I am” (reversed), “This post is different from others on my profile” (reversed), and “This post does not capture how I see myself” (reversed). This scale showed strong reliability, $\alpha = 0.85$.

3.3.2.3. Audience. Participants were asked to estimate how many people could see each post (*audience size*), and who in their Facebook network could see the post: partner/spouse, friends, acquaintances, classmates, coworkers, family, boss, potential employers, teachers, people they don't know. Audience diversity has previously been measured as the variety of sub-groups that are present in one's network (Litt et al., 2014; Vitak, 2012). Thus, *audience diversity* was calculated by summing the number of categories that participants thought could see the post, ranging from zero to 10 based on the number of relationship type categories that were selected.

3.3.2.4. Relationship. Participants reported how close they were to the person making each post, including the experimental post, with one item (1 = No relationship at all – 5 = Very close).

3.3.2.5. Response to post. For the embarrassing post only, targets completed three items regarding how likely they would be to take each action in response to their partner's post (1 = Very unlikely – 5 = Very likely): delete the post, make light of the post by joking about it, or ignore the post and do nothing about it.

3.3.3. Video recordings

Both participants' screens were recorded using screen recording software. In addition, targets' faces and upper bodies were video-recorded. Screen and video recordings were synchronized to identify nonverbal responses to specific posts. Forty-seven of 60 participants in the target role consented to being recorded, but due to technical issues we only had 17 usable recordings for coding. The available videos were spread equally across the three face-threat conditions, and statistical analyses confirm that participants for whom videos were available did not differ significantly from those without video recordings in terms of age, gender, the embarrassing post type, or any of the predictors or outcomes in the study.

3.4. Analytic approach

3.4.1. Text content

The text of the embarrassing posts was content analyzed using an adaptation of the Sharkey and Stafford (1990) coding scheme (detailed in Table 1), which describes five types of embarrassing situations. In the present study we reduced the scheme to four given that there were no posts about lack of knowledge or skill. Two coders rated the posts with excellent reliability (Scott's Pi = 0.80). After all posts were analyzed and reliability established, disagreements were discussed and resolved between the two coders, and this resolved coding scheme was used for analysis.

3.4.2. Video content

Two independent coders coded the videos for facial expressions, body positions, and vocalizations for the 20 seconds before and after seeing the embarrassing post to gauge for nonverbal changes in response to the post. The coding scheme was informed by Costa,

Table 1
Types of embarrassing posts made.

Category	Definition	Example	Percent
Criticism	Criticism or rejection, praise or flattery, teasing, and being made the center of attention	You need stop liking all these different guys! And decide who for sure you like!	36%
Privacy violation	Exposure of the body, clothing, or an intimate act; the invasion of space or property; and the revealing of private or secret information	I heard your noises last night with your boy ... keep it down next time [partner]	29%
Appropriate image violation	Expresses a concern for one's body, clothing or personal possessions	Remember the last day before school ended where you got really drunk off vodka and needed help? Dat [local restaurant], [partner]	22%
Awkward acts	Situationally inappropriate acts; ungraceful, clumsy or awkward acts ... "discrepancy between an expected self-presentation and the actual behavior displayed"	This is just to let the world know that [partner] fell on the walk to [campus building] not once but twice today ... with boots. Twice.	14%

Dinsbach, Manstead, and Bitti's (2001) assessment of nonverbal responses to embarrassment. Coders first coded a subset of five randomly selected videos independently, and coding discrepancies were discussed until agreement on response types was reached. Coders then coded the full set of videos, resulting in 81% agreement on all responses before the post and 78% agreement on all responses after the post. Discrepancies were viewed and resolved by a third, independent coder.

4. Results

4.1. Content analysis of embarrassing posts

We first examined how the confederates embarrassed their partners with a post putatively placed on the partner's Facebook Timeline, by focusing on their embarrassment strategy. The content analysis revealed that confederates used the criticism strategy in 36% of the posts, revealed privacy violations in 29%, violated their sense of appropriate image in 22%, and described awkward acts in 14% of the posts. Chi-square analysis indicates that the prevalence of these categories was not significantly different from chance: $\chi^2(3, N = 59) = 6.29, p = 0.10$, suggesting that the different strategies were used at roughly equal rates. Examples of each type of post are shown in Table 1.

Recall that confederates were randomly assigned to three instruction conditions for embarrassing their partner: violate a norm, threaten partner self-presentation, or associate them with something undesirable. We therefore examined whether confederates used the four embarrassment strategies differently across the three conditions. A chi-square analysis revealed that there were no significant differences across conditions, $\chi^2(6, N = 59) = 7.21, p = 0.30$, suggesting that confederates did not select embarrassment strategies in response to the instructions.

4.2. Emotional reactions to face-threatening posts

To test whether a face-threatening post causes embarrassment, ANOVA was conducted to compare the level of embarrassment in response to the face-threatening post made about the target to the innocuous post made about the confederate. The embarrassment factor was tested for homogeneity of variances and normality, and met both assumptions. Hypothesis 1 stated that a post which contains face-threatening information would cause greater embarrassment than one which does not. Targets found the post by the confederate significantly more embarrassing than the confederates found the non-embarrassing post by the target, $F(1, 115) = 64.81, p < 0.001, R^2 = 0.36$. The effect size was large ($d = 1.50$) according to Cohen's (1988) guideline, with the type of post accounting for 36% of the variance. This suggests that the embarrassment effect was powerful and supports H1.

RQ1 asked whether the type of face threat (norm violation, ideal

self-presentation violation, or association effect) would moderate the effect of a face-threatening post. ANOVA was used to test the effects of face-threat type on embarrassment for the targets, and the data revealed that the face-threat types did not differ in their effect on embarrassment, $F(2, 49) = 0.66, p = 0.52$. That is, all types of face threats were perceived as equally embarrassing. We also tested whether the posting strategy (criticism, privacy violations, violations of appropriate image, awkward acts) had an effect on embarrassment. Likewise, different post types had no effect on self-reported embarrassment; all were equally embarrassing, $F(3, 49) = 0.82, p = 0.49$. For the following analyses, therefore, we collapsed across the face-threat instruction conditions unless otherwise noted.

4.2.1. Nonverbal responses

The facial response data from the video recordings offer further support. Table 2 shows the rates of recorded nonverbal responses by the target 20 seconds before and 20 seconds after the confederate's embarrassing post: smiling, frowning, eyebrow raises, eyes widening, laughing, breathing, talking, jaw dropping, shaking their head, mouth opening or closing, and other lip movements. Hypothesis 2 predicted that participants would exhibit perceptible changes in these nonverbal responses as a result of the face-threatening post. Matched-pair *t*-tests comparing the frequency of these nonverbal responses before and after the post revealed significant changes in several nonverbal responses.

The target's breathing patterns changed, $t(16) = 4.19, p < 0.001$, with more holding of one's breath and more sharp exhales; Additionally, their mouth movements increased significantly after seeing the post, $t(16) = 5.68, p < 0.001$. Participants also exhibited increased eyebrow raising consistent with surprise expressions, $t(16) = 2.70, p < 0.05$; more shaking of the head, $t(16) = 2.22, p < 0.05$; more nervous laughter, $t(16) = 3.79, p < 0.01$; and more nervous smiling, $t(16) = 5.16, p < 0.0001$. Frowning, jaw dropping, eyes widening, and vocalizations also increased as a result of seeing the post, but not significantly. These data provide support for H2.

4.3. Predictors of embarrassment

Taken together the self-report and nonverbal data indicate that the face-threatening post from the confederate produced a strong embarrassment reaction. Next, we examine what factors predicted embarrassment. Using the target sub-sample, a hierarchical linear regression model tested the effects of face threat type, post strategy, identity captured, audience size, and audience diversity on embarrassment and the three responses to the post (joke, delete, do nothing), with age, gender, and relationship closeness as control measures. The final model of predictors was significant, $F(10, 48) = 5.18, p < 0.001, R^2 = 0.52$.

Table 2
Nonverbal responses to post.

Response instances	<i>M</i> (<i>SD</i>)		<i>t</i>
	Before post	After post	
Mouth opening or closing (state changes)	1.41 (0.71)	4.71 (2.42)	5.68***
Smiling	0.29 (0.77)	2.53 (1.66)	5.16***
Taking breathes	0.12 (0.33)	0.76 (0.78)	4.19***
Laughing	0	0.76 (0.83)	3.79**
Eyebrows raised	0	0.37 (0.72)	2.70*
Shaking head “no”	0	0.24 (0.43)	2.22*
Eyes widening	0	0.18 (0.39)	1.85
Jaw dropping	0	0.12 (0.33)	1.46
Vocalizations	0.12 (0.49)	0.29 (0.59)	1.14
Frowning	0.24 (0.56)	0.47 (0.87)	0.89
Lip movements (biting, sucking in, twisting, pursing)	0.35 (0.49)	0.47 (0.72)	0.70

Note: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

4.3.1. Identity consistency

The level of embarrassment was predicted by the degree to which the target felt that the confederate's post was inconsistent with their identity, $F(1, 48) = 33.11$, $p < 0.001$, $\beta = -0.63$. Recall that identity consistency was calculated using a scale of how accurately posts on the participants' Timeline represent them. The more consistent the post was with their desired presentation of their identity, the less embarrassed the target felt by it. This pattern of results supports H3.

4.3.2. Unknown audience members

Next, we predicted that greater audience diversity would increase embarrassment (H4). Audience diversity did not have an effect on embarrassment, $F(1, 48) = 1.06$, $p = 0.10$, providing no initial support for H4. We ran an additional regression model to test the effects of the presence of each category of Facebook friend (e.g., partner, family) who could likely see the post on embarrassment. The target felt significantly more embarrassed if they thought that strangers could see the post, $F(1, 48) = 4.41$, $p < 0.05$, $\beta = -0.39$. This suggests that the real fear about who will see a given post is not in the more abstract notion of audience, but specifically that face-threatening information could be seen by those who may not know the individual.

4.4. Mitigation strategies

Given that face-threatening posts caused embarrassment, we examined how individuals responded to these posts to reduce embarrassment, such as whether to joke about the post, delete it, or do nothing about it. Overall, participants were most likely to joke about the post ($M = 4.2$, $SD = 0.96$). Those who were most embarrassed by the post were more likely to delete the post, $F(1, 48) = 29.13$, $p < 0.001$, $\beta = 0.61$. Additionally, the results revealed that the more consistent the post was with their identity, the less likely they were to delete the post, $F(1, 49) = 20.91$, $p < 0.001$, $\beta = -0.59$. These results provide support for H5a, but not H5b.

5. Discussion

The results of this study advance our understanding of how individuals react emotionally and nonverbally to face-threatening posts made by their friends on Facebook. Face-threatening posts triggered a strong embarrassment effect, regardless of the specific content or the type of face threat. Two key factors drove embarrassment. The first was whether the post was inconsistent with the participant's sense of identity. The more a post diverged from a target's identity the more embarrassing the post, and the stronger the emotional and nonverbal response to the post. The second was

the nature of the audience, though not in terms of overall diversity. Embarrassment was not affected by how many different types of people participants thought could see the post, but instead was influenced by whether the participant thought the post was visible to an unknown audience. These results suggest that the primary concerns for an individual who has just been embarrassed by a friend on the site is whether an audience that does not know them well will see an unrepresentative account of their identity. Embarrassment on Facebook is driven by the quasi-public threat to one's identity, rather than the revelation of any particular information.

Both the emotional and nonverbal responses highlight the key fact that for embarrassment to happen online, an audience needs only to be imagined, not present. Individuals exhibited many nonverbal responses to the embarrassing post, such as increased smiling, laughing, changes in breathing, and head movements, despite the lack of a co-present audience to witness these responses. In reality the post was hidden from their network, and their identity was not threatened, yet participants reacted strongly to the possibility that it was. Together, these findings suggest that on Facebook, one's identity is in part shaped by notions of the imagined audience. That is, while individuals attempt to craft an ideal self-presentation, this self-presentation is modified by others who share information about them.

Finally, strategies for dealing with face-threatening information were informed by a sense of how the embarrassing information fit into one's identity in their Facebook network. The more embarrassed participants were, the more likely they were to delete the post. Yet, as the post was more consistent with their identity, they were less likely to delete it. If the post is better aligned with their online identity and desired self-presentation, they will feel less of a need to remove that content.

5.1. Theoretical implications

The present research provides one of the first explorations of the process of embarrassment by others as it unfolds in real time with online content. The results extend our understanding of the embarrassment process to the context of Facebook, and reveal that the process maps onto Edelman's original formulation (1985): Individuals attempt to manage their impressions online by engaging in selective self-presentation, a disruption to this self-presentation (a face-threatening post) creates an undesired impression, and an awareness of this discrepancy (seeing the post and believing it to be visible to others) leads to a focus of attention on oneself, as evidenced by the nonverbal responses to the post. The idea of an audience, in this case unknown, shifts focus to a public self, and this leads to feelings of embarrassment.

Consistent with Robbins and Parlavocchio's (2006) unwanted exposure model, which focuses on the revelation to an audience something that one prefers to keep hidden, embarrassment on Facebook is also driven by a concern over the audience, especially the part of the audience that is unidentifiable. As with more traditional communication settings, it is strangers from whom individuals would most like to keep something hidden. In contrast, the nature of the embarrassing event is less important. Previous research has categorized many types of events that may lead to embarrassment face to face (Sabini et al., 2000; Sharkey & Stafford, 1990), and on Facebook (Litt et al., 2014). Yet, our data suggest that these distinctions for face threats matter less for embarrassment responses than whether the post, regardless of what information it revealed, violates the individual's sense of identity. This indicates that embarrassment on a social networking site moves past the simple details of a face-threatening event to their potential to disrupt ideal self-presentation in a larger network.

Another difference is how information is presented in this setting, and in turn how individuals can respond to the embarrassing information. Information posted on Facebook may be seen by others before it is seen by the target, creating unique circumstances where the target individual cannot intervene in time. The common strategies such as making excuses, justifying the information, apologizing, or joking about the post (Edelmann, 1985; Metts & Cupach, 1989) no longer make sense in this situation where the response may be delayed, and in which others may have responded first. In this case, individuals must choose different strategies for controlling the information. Individuals are most likely to delete the post so it does not draw any further attention. This action is unique to an online environment such as Facebook, rendering traditional facework methods less necessary or useful.

Despite these differences, emotional and nonverbal responses to online embarrassment turn out to be very similar to embarrassment in face-to-face settings. Individuals felt a host of negative emotions, and reacted nonverbally in ways common to other embarrassing situations, such as laughing and smiling (Costa et al., 2001; Edelmann & Hampson, 1979; Fink & Walker, 1977; Sharkey & Stafford, 1990). Interestingly, these responses were exhibited by individuals who were not present with the person who embarrassed them or those who might see the embarrassing posts. This provides evidence that embarrassment is fully expressed even when the audience is only imagined, while also highlighting that the potential audience in an online forum is as real as a physically present audience.

5.2. Limitations and future research

While these findings shed early light on embarrassment from online content, future research is needed to overcome some limitations. First, this study did not give participants all potential strategies for responding to the post. Participants were asked whether they would delete the post, joke about it, or do nothing, but there are a number of other documented strategies, both online and offline, that they could employ. For instance, blocking the offending friend is also a strategy employed (Peña & Brody, 2014). More observation is needed of all the ways in which individuals actually respond to face-threatening posts.

Second, due to the design of this study, participants were embarrassed only by someone they were close to, which for nearly all participants was a close friend. Posts by different connections such as friends, family member, coworkers, and acquaintances are likely to vary greatly in terms of the type and severity of embarrassment. For instance, the severity of embarrassment has been found to vary between friends and strangers (Fortune & Newby-Clark, 2008; Müller-Pinzler et al., 2016), sources of

embarrassment may differ between romantic partners (Hall, 2011), and particular relationships, such as child-parent relationships on Facebook, present different intimacy and privacy concerns (Kanter, Afifi, & Robbins, 2012). More types of relationships between the creators and targets of embarrassing information need exploration to understand the complex interactions of a variety of relationships on Facebook.

Finally, this study is limited by the sample, which is comprised primarily of university students. While these individuals are representative users of Facebook, the types of events that embarrass those in their early 20s, and their online interactions may differ considerably from those of other age groups. Furthermore, most dyads were female-female, so these data are not representative of other relationship compositions. This research needs to be extended to a more diverse sample to test how responses to embarrassment on Facebook change by age, professional setting, and the different types of networks that individuals could have on the site.

5.3. Conclusion

The results of this experiment show that something as simple as a Facebook post by a friend can produce strong emotional and nonverbal responses. This effect holds true no matter what information is revealed, indicating it is not what is shared, but whether anything unwanted is shared at all. Overall, the process of embarrassment largely matches what is seen in face-to-face settings, while certain elements, such as an unknown audience, may even magnify the outcome. This suggests that we must not treat these environments, their content, or their audience as though they are not "real," given that their emotional influence is very real.

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