Research Article

Shame Broadcasts Social Norms: The Positive Social Effects of Shame on Norm Acquisition and Normative Behavior

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Abstract
How does shame affect social cohesion? Prior work has drawn divergent conclusions to this question because shame can spur maladaptive behaviors for people who experience it. However, past work has overlooked the interindividual effects of shame—how one's expression of shame affects people who witness it. We investigated these social-learning effects of shame and identified norm transmission as a reliable route by which shame facilitates social cohesion. Across five studies and two supplemental studies with U.S.-based adult participants ($N = 3,726$), we manipulated whether someone conveys shame, no specific emotion, or other discrete emotions regarding their behavior. We then assessed the effect of this emotional expression on participants' norm inferences and norm-conforming behavior. We found that shame broadcasts particularly strong signals about social norms, and people adjust their behavior to align with these norms. We discuss how these findings challenge common conclusions about shame and generate insights about shame's influence on social life.

Shame occupies an increasingly prominent place in public discourse.[1] Popular press writings decry the consequences of a growing shamelessness in society as well as the futility of shame for fostering social cohesion (Bruni, 2018; Goldberg, 2020). Group life depends on social cohesion or people adhering to shared standards to guide their behavior and relationships (Friedkin, 2004; Hogg, 1992). Given growing public concern about both shamelessness and shaming (Bruni, 2018; Goldberg, 2020), understanding whether and how shame facilitates social cohesion is theoretically and practically important.

Shame is a negative, self-conscious emotion that arises from social relationships in which people evaluate and negatively judge themselves from the perspective of others (Lewis, 1971; Scheff, 2014). Shame signals a painful discrepancy between one's actual self and one's ideal self and signals a threat of social devaluation (Sznycer et al., 2016; Tangney et al., 1998).

In prior work, it has been debated whether or how shame affects social cohesion. In the present work, we broadened the investigation of shame from the effects of personally feeling ashamed to the consequences of learning about other people's feelings of shame. Specifically, we tested two primary predictions. First, shame expressions facilitate norm acquisition—people infer the content of group norms from other people's shame expressions. Second, shame expressions engender norm conformity in other individuals—people are more likely to conform with inferred social norms after witnessing someone express shame.

We based these predictions on the following observations. First, people follow normative standards because failing to do so risks social censure and devaluation (Boyd & Richerson, 2009; Dannals & Miller, 2017), and people observe others to learn the content of these

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normative standards (Bandura & Walters, 1977; Boyd et al., 2011). Second, people can readily infer from others' emotional expressions the antecedent state that produced the emotion (Hareli et al., 2013; Van Kleef, 2016). Third, violating norms is a common antecedent state of shame (Fessler, 2007; Higgins, 1987), and people express shame, in part, to affirm their awareness of their norm violation (Keltner, 1995; Keltner & Harker, 1998; Martens et al., 2012).

Integrating the above observations suggests that when learning that someone feels or would feel ashamed about a behavior, people will deduce that this behavior is normatively inappropriate in this person's social context. People will then adjust their behavior accordingly in this context to behave in more socially appropriate ways, presumably to avoid feeling ashamed themselves (see Fessler, 2004). We found support for these predictions across five studies and two supplemental studies in which we manipulated a target's emotional expression and assessed the effect on observers' inferences about a group's social norms and subsequent normative behavior.

The idea that shame facilitates social cohesion through social learning aligns with theories of cultural evolution that emphasize the importance of social learning for the transmission of normative behaviors (Boyd et al., 2011; Chudek & Henrich, 2011). However, this prediction contrasts with conclusions from past empirical work on shame. Some prominent reviews of shame have questioned shame's positive effect on social cohesion (see Tangney et al., 2007a, 2007b), given shame's relationship with problematic social behaviors and hostility toward other people (e.g., Stuewig & Tangney, 2007; Tangney et al., 1996; Tangney et al., 2014). Other scholars have been more circumspect, concluding that shame's effects on appropriate behavior depend on third variables, such as the perceived repairability of the offense (Bagozzi et al., 2003; de Hooge et al., 2010; Harris & Darby, 2009; Leach & Cidam, 2015; Sznycer, 2019).

However, this past work focused on the intraindividual effects of feeling ashamed (e.g., how my feelings of shame affect me) and, thus, overlooked critical ways that shame can affect other relevant social actors. Examining the interindividual effects of shame (e.g., how my feelings of shame affect you) allowed us to generate novel predictions in the present work about how and why shame facilitates social cohesion.

Overall, the present findings show that shame transmits cultural information about social norms and thus promotes norm acquisition and normative behavior. In doing so, this work helps to reconcile competing views about shame and further challenges the idea that shame undermines social cohesion (Tangney et al., 2007a, 2007b). This work contributes to research on the social

Statement of Relevance

You observe a colleague at your new job express shame about something they did at work. While past research on shame has focused on how this colleague's feelings of shame affect them, the present work focused on how these feelings affect you. We found the following. People rely on others' shame, more so than other emotions, to infer how they should or should not behave in a social context. Moreover, after observing someone else feel ashamed, people subsequently conform more to social norms, even when this conformity costs them financially. These findings provide foundational evidence that one person's shame affects others' normative behavior. They also establish social learning as a key mechanism through which shame facilitates social cohesion. Finally, these findings suggest that conclusions about the effects of shame or shamelessness in society requires identifying how shame affects all relevant social actors, not just the person who experiences shame directly.

information that people infer from others' emotional expressions (Hareli et al., 2013; Van Kleef, 2016). For instance, past work has found that people infer norms from emotions in social situations (i.e., a group getting angry at someone for a behavior; Hareli et al., 2013, 2015). We expanded on these findings by identifying how a person's emotional response to their behavior affects individuals who witness it, opening new perspectives about the interindividual consequences of self-conscious emotions (Martens et al., 2012; Martens & Tracy, 2013).

Overview of Studies

In each study, we varied whether a target expressed shame about a behavior. We then assessed participants' inferences about the injunctive and descriptive norms regarding the behavior and their behavioral intentions (Studies 1, 2, and 3; see also Study S1 at https://osf.io/unpq4/) or their incentivized behavior (Studies 4 and 5; see also Study S2 at https://osf.io/unpq4/). We made no a priori predictions about whether shame would affect injunctive and descriptive norms differently. Although past work has found that shame arises from norm violations (Fessler, 2007; Higgins, 1987), the authors of those studies did not delineate between injunctive and descriptive norms in their theorizing about the antecedents of shame (e.g., Van Kleef et al., 2015). Thus, we measured
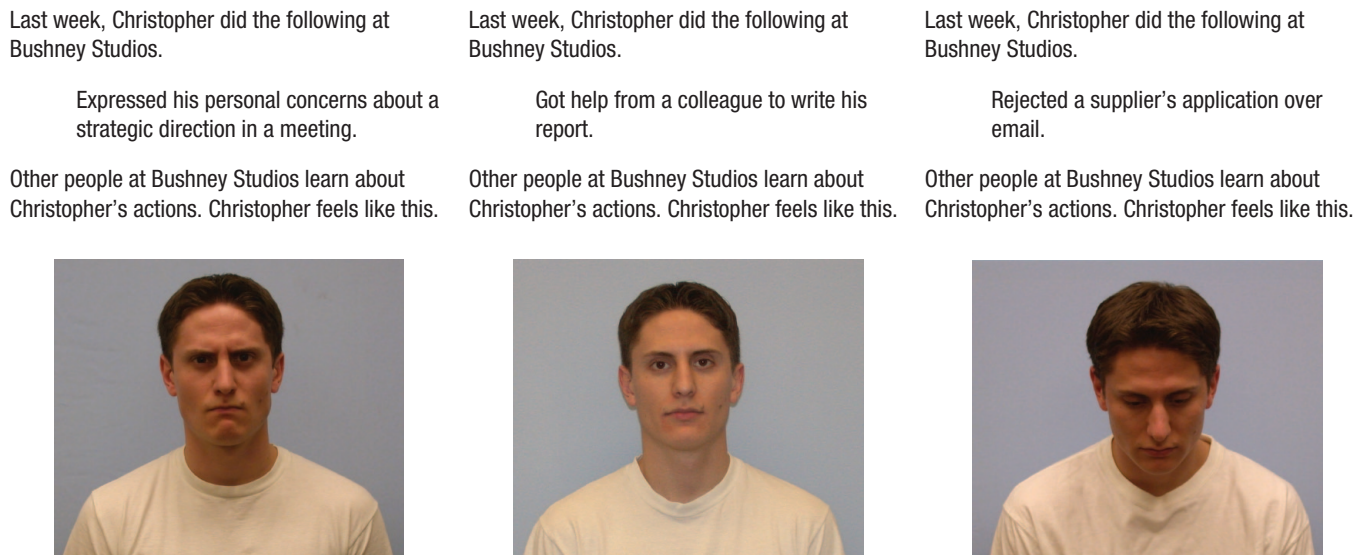
Last week, Christopher did the following at Bushney Studios.

  Expressed his personal concerns about a strategic direction in a meeting.

Other people at Bushney Studios learn about Christopher's actions. Christopher feels like this.

Last week, Christopher did the following at Bushney Studios.

  Got help from a colleague to write his report.

Other people at Bushney Studios learn about Christopher's actions. Christopher feels like this.

Last week, Christopher did the following at Bushney Studios.

  Rejected a supplier's application over email.

Other people at Bushney Studios learn about Christopher's actions. Christopher feels like this.

Fig. 1. Example of the stimuli used to manipulate the emotion an employee expressed about a workplace behavior (Study 1). Stimuli were developed using the UC Davis Set of Emotion Expressions (Tracy et al., 2009). The emotional expressions are, from left to right, anger, neutral, and shame. We varied the target's name and the company's name (for details, see https://osf.io/unpq4/).

both types of norms to explore whether people infer both injunctive and descriptive normative content from witnessing others' shame expressions.

Given our focus on norm acquisition, we avoided behaviors in which a universal norm already exists. We operationalized shame differently across the studies for stimulus-sampling purposes, including having a target convey that they felt ashamed (Studies 1, 4, 5, S1, and S2) or would feel ashamed (Studies 2 and 3) through nonverbal expressions (Studies 1, 4, 5, and S2), responses to a workplace questionnaire (Studies 2 and 3), or text conversations (Study S1).[2] The University of Pennsylvania Institutional Review Board approved all the studies. We posted the study materials and deidentified data on OSF (https://osf.io/ujhn9/).

Study 1

In Study 1, we manipulated whether an employee expressed shame, expressed anger, or had a neutral reaction to a workplace behavior and assessed the effect on participants' inferences about the workplace's norms and behavioral intentions. We compared shame with anger because anger communicates a violation of expectation and disapproval (Hareli et al., 2013; Van Kleef et al., 2004). Thus, this comparison provides insight into the relative magnitude of shame's effect on norm acquisition.

Method

Participants. We administered Study 1 as part of an online mass-testing session in the university's behavioral research lab. The size of the mass-testing session determined the sample size. We received completed responses from 190 participants (146 women, 44 men; age: $M = 21.11$ years, $SD = 2.39$). We did not preregister this study, and we included all participants in our analyses.

Procedure. Participants read about an employee (e.g., "James") and three different behaviors that this employee engaged in at their company (e.g., "Baxter Financial"). Participants saw the employee's emotional response to each of these behaviors and answered questions about each behavior. Figure 1 shows an example of the stimuli.[3]

We randomly sampled three workplace behaviors (without replacement) from a larger bank of behaviors, shown in Table S1 at https://osf.io/unpq4/. Two examples of the workplace behaviors are "Shared a wild, very out-of-the-box idea during a meeting" and "Challenged their supervisor's judgment in a meeting."

We presented behaviors one at a time and randomly determined, with replacement, whether the employee conveyed shame, anger, or a neutral expression about their behavior. This approach meant that participants could see the target express shame in response to zero, one, two, or three workplace behaviors.

For each behavior, we measured three dependent variables. We measured perceptions of the company's injunctive norms about the behavior (i.e., the extent to which employees at the company should not engage in this behavior) and perceptions of the company's descriptive norms about the behavior (i.e., the extent to which it is uncommon for employees at the company to engage in this behavior). We also measured participants' behavioral intentions (i.e., the likelihood of engaging in this

Table 1. Full List of Scale Items Used to Measure Injunctive Norms, Descriptive Norms, and Behavioral Intentions (Studies 1–3)

Measure and item

Study 1

Injunctive norms (should not do; α = .93)

To what extent at [company name] is [workplace behavior] discouraged? (1 = *not at all*, 5 = *extremely*)

To what extent at [company name] is [workplace behavior] the wrong way to behave? (1 = *not at all*, 5 = *extremely*)

To what extent at [company name] is [workplace behavior] an inappropriate way to act? (1 = *not at all*, 5 = *extremely*)

To what extent does [workplace behavior] violate the norms of behavior at [company name]? (1 = *not at all*, 5 = *extremely*)

Descriptive norms (uncommon to do; α = .96)

To what extent is [workplace behavior] an atypical way to act at [company name]? (1 = *not at all*, 5 = *extremely*)

To what extent is [workplace behavior] an abnormal way to act at [company name]? (1 = *not at all*, 5 = *extremely*)

To what extent is [workplace behavior] an uncommon way to act at [company name]? (1 = *not at all*, 5 = *extremely*)

Behavioral intentions (likely to do)

Imagine that you are a new employee at [company name]. You want to succeed at [company name]. How unlikely or likely are you to [workplace behavior]? (1 = *very unlikely*, 5 = *very likely*)

Study 2

Injunctive norms (should not do; α = .91)

At [company name], how acceptable or unacceptable is it for employees to [workplace behavior]? (1 = *very unacceptable*, 5 = *very acceptable*)[a]

At [company name], are employees encouraged or discouraged from [workplace behavior]? (1 = *very discouraged*, 5 = *very encouraged*)[a]

Do you think employees at [company name] would be punished or praised for [workplace behavior]? (1 = *strongly punished*, 5 = *strongly praised*)[a]

Descriptive norms (uncommon to do; α = .91)

To what extent at [company name] is [workplace behavior] an uncommon or common thing to do? (1 = *very uncommon*, 5 = *very common*)[a]

To what extent at [company name] is [workplace behavior] an uncustomary or customary thing to do? (1 = *very uncustomary*, 5 = *very customary*)[a]

Behavioral intentions (likely to do)

Imagine that you are a new employee at [company name]. You want to succeed at [company name]. How unlikely or likely are you to [workplace behavior]? (1 = *very unlikely*, 5 = *very likely*)

Study 3

Injunctive norms (should not do; α = .91)

At [company name], how acceptable or unacceptable is it for employees to [workplace behavior]? (1 = *very unacceptable*, 5 = *very acceptable*)[a]

At [company name], are employees encouraged or discouraged from [workplace behavior]? (1 = *very discouraged*, 5 = *very encouraged*)[a]

Do you think employees at [company name] would be punished or praised for [workplace behavior]? (1 = *strongly punished*, 5 = *strongly praised*)[a]

Descriptive norms (uncommon to do; α = .91)

To what extent at [company name] is [workplace behavior] an uncommon or common thing to do? (1 = *very uncommon*, 5 = *very common*)[a]

To what extent at [company name] is [workplace behavior] an uncustomary or customary thing to do? (1 = *very uncustomary*, 5 = *very customary*)[a]

Behavioral intentions (likely to do)

Imagine that you are a new employee at [company name]. You want to succeed at [company name]. How unlikely or likely are you to [workplace behavior]? (1 = *very unlikely*, 5 = *very likely*)

Note: Injunctive norms are scored such that higher values equate to stronger proscriptions against a behavior (should not do), descriptive norms are scored such that higher values equate to the behavior being uncommon (uncommon to do), and behavioral intentions are scored such that higher values equate to being more likely to engage in the behavior (likely to do). Alpha levels are calculated at the observation level. Content in brackets was dynamically populated on the basis of which company name and which workplace behaviors were pulled randomly from the larger bank of company names and behaviors.

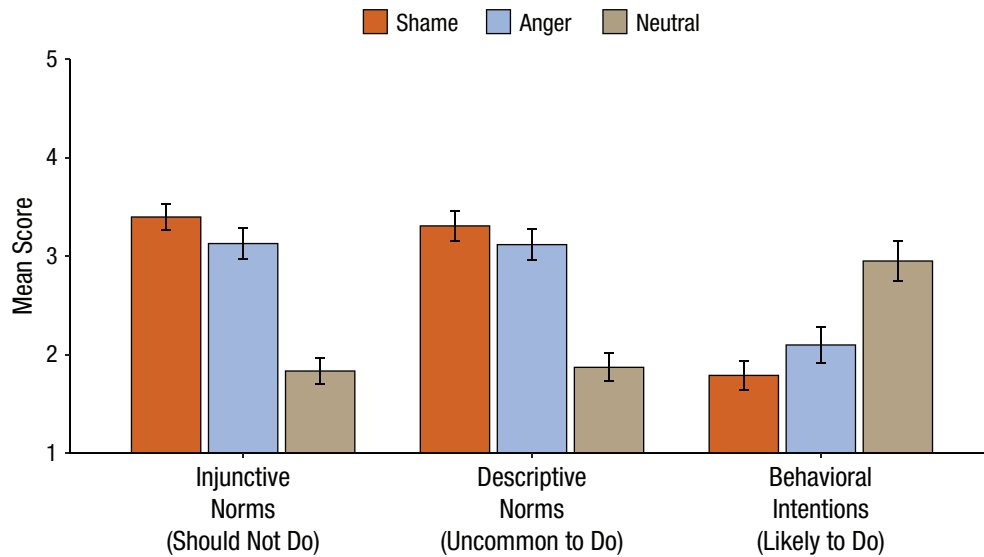[a]This item was reverse-scored.

Fig. 2. Mean rating of perceived injunctive norms, descriptive norms, and behavioral intentions for each emotional expression made by the employee (Study 1). Error bars represent 95% confidence intervals.

behavior if they worked at the company). Table 1 shows the exact items we used to measure these variables and the internal consistency of these measures. For each dependent variable, we averaged the items to create a composite measure.

To check that the manipulation was successful, at the end of the study, we showed participants four pictures of the employee with an ashamed, angry, happy, or neutral expression. We did not manipulate happiness. We included a picture of the employee expressing happiness in the manipulation check to limit participants' suspicion that the purpose of the study was focused on negative emotions. Participants selected which emotion the employee expressed from five options (happy, angry, ashamed, neutral, surprised).

Results

Manipulation check. Nearly all participants (96%, *n* = 180) accurately identified all four emotions.

Analysis. Our analyses were at the level of an individual workplace behavior. Each participant answered questions about three behaviors, so the total number of observations for the analyses was 570. Our predictor variable was the target's emotion in response to the behavior: a neutral expression, anger, or shame. We created three dummy variables corresponding to each of the three emotions. There were three dependent variables: injunctive norms (i.e., should not do), descriptive norms (i.e., uncommon to do), and behavioral intentions (i.e., likely to do). In each regression model, we regressed one dependent variable on two of the three dummy variables. We clustered standard errors by participant.

We calculated Cohen's f^2 as a measure of effect size given that we had multiple observations within participant, following the guidelines of Selya and colleagues (2012). According to Cohen (1988), $f^2 \geq .02$, $f^2 \geq .15$, and $f^2 \geq .35$ represent small, medium, and large effect sizes, respectively.

We made no primary predictions about the effect of any specific workplace behavior, employee name, or company name, so we collapsed across these attributes in the primary analyses.

Hypothesis tests. As shown in Figure 2, participants perceived stronger injunctive norms at a company when the employee expressed shame than when the employee had a neutral reaction or expressed anger (see Table 2, Models 1 and 2). Participants judged a behavior as less common when the employee expressed shame than when the employee had a neutral reaction or expressed anger, although the latter difference was marginally significant (see Table 2, Models 3 and 4). Participants were less likely to engage in a workplace behavior when the employee expressed shame than a neutral reaction or anger (see Table 2, Models 5 and 6).

Exploratory analyses showed that these effects were consistent across individual workplace behaviors (see Fig. S1 at https://osf.io/f3kw6/), the names assigned to the company (see Fig. S2 at https://osf.io/f3kw6/), and the names assigned to the employee (see Fig. S3 at https://osf.io/f3kw6/). We simulated a between-subjects design by restricting the analysis to the first behavior

Table 2. Results of Regression Models Predicting Injunctive Norms, Descriptive Norms, and Behavioral Intentions From Emotional Expressions (Study 1)

| | Injunctive norms (should not do) | | | | | | Descriptive norms (uncommon to do) | | | | | | Behavioral intentions (likely to do) | | | | | |
| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | | Model 6 | | |
Predictor	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²
Shame	1.56 (0.10)	<.0001	.66				1.44 (0.10)	<.0001	.51				-1.16 (0.13)	<.0001	.21			
Anger	1.29 (0.10)	<.0001	.48	-0.27 (0.10)	.007	.01	1.25 (0.10)	<.0001	.40	-0.19 (0.11)	.075	.00	-0.85 (0.14)	<.0001	.13	0.31 (0.11)	.004	.01
Neutral				-1.56 (0.10)	<.0001	.66				-1.44 (0.10)	<.0001	.51				1.16 (0.13)	<.0001	.21
Constant	1.84 (0.07)	<.0001		3.40 (0.07)	<.0001		1.87 (0.07)	<.0001		3.31 (0.08)	<.0001		2.95 (0.10)	<.0001		1.79 (0.08)	<.0001	

Note: $N = 570$. Standard errors are adjusted for 190 clusters. Higher values equate to stronger proscriptions against the behavior (injunctive norms), less common behaviors (descriptive norms), and stronger intentions to engage in the behavior (behavioral intentions). Anger, shame, and neutral are all dummy variables. Models 1, 3, and 5 compare shame and anger with a neutral expression. Models 2, 4, and 6 compare shame with a neutral expression and anger. For the raw mean and standard deviation of each measure for each emotion, see Table S1 at https://osf.io/f3kw6/.

that participants evaluated. The effects were consistent under this separate evaluation (see Fig. S4 at https://osf.io/f3kw6/). Overall, Study 1 provided initial evidence that people learn the content of social norms from others' expressions of shame.

Study 2

In Study 2, participants evaluated an employee's supposed responses to a workplace questionnaire regarding how they would feel about engaging in various workplace behaviors: ashamed, anxious, sad, neutral, happy, or proud. Comparing shame with sadness and anxiety provided another test of the relative magnitude of shame's effect on norm acquisition. We included happiness and pride for exploratory purposes.

Method

Participants. We posted a study to Prolific Academic for 500 U.S.-based participants, intending to retain 75 participants (150 observations) per condition. After we followed our preregistered data-exclusion plan (see Table S2 at https://osf.io/unpq4/), the final sample consisted of 490 people (239 women, 237 men, 10 indicated a different gender identity, four preferred not to state their gender; age: $M = 32.41$ years, $SD = 12.37$). We preregistered the study at https://aspredicted.org/KXE_VWS.

Procedure. We manipulated how an employee reported that they would feel for engaging in various workplace behaviors. We did this under the guise of having participants review someone's responses to a confidential, online workplace survey (for similar paradigms, see Levine & Wald, 2020; Schaumberg & Flynn, 2012). We told participants the following:

> A confidential survey was done to assess employees' reactions to various things someone could do at their company (e.g., showing up five minutes late to a meeting; attending virtual conferences during the workday). We asked 152 employees at Baxter Financial to imagine that they engaged in various behaviors at Baxter Financial (e.g., attended a virtual conference during the workday) and how they would feel about engaging in this behavior. Employees selected the expression that captured the emotion they would feel in response to the behavior.

We gave participants a screenshot of this supposed questionnaire as an example (see Fig. 3). We explained that employees had the option of selecting ashamed,

anxious, sad, neutral, happy, or proud. The emotion the employee selected indicated how the employee said they would feel about engaging in the behavior.

Participants saw the employees' supposed responses to two workplace behaviors, which we randomly assigned without replacement. We manipulated how the employee would feel about engaging in the behavior by varying which emotion the employee selected.

We randomly paired one of the six emotional expressions with each workplace behavior, without replacement. Participants then answered questions about the company's injunctive norms and descriptive norms about the behavior. They also indicated their likelihood of engaging in the behavior if they worked at the company. The full list of questions is in Table 1.

Results

Analysis. We followed the same analysis plan as described in Study 1. Each participant answered questions about two behaviors, so the total number of observations for the analyses was 980. We created six dummy variables corresponding to each of the six emotions. In each regression model, we regressed one of the three dependent variables on five of the six dummy variables: injunctive norms (i.e., should not do), descriptive norms (i.e., uncommon to do), and behavioral intentions (i.e., likely to do). We clustered standard errors by participant.

Hypothesis tests. Figure 4 shows mean differences in the dependent variables across the six emotion conditions. Table 3 shows the regression results.

Participants inferred stronger injunctive norms against a behavior when the employee expressed shame than each of the other discrete emotional expressions (see Table 3, Model 2). Participants also inferred that a behavior was less common when an employee expressed shame than when they expressed the other discrete emotions (see Table 3, Model 4). Participants were also the least likely to engage in the behavior when the employee expressed shame, except compared with sadness (see Table 3, Model 6). The results were consistent across the sampled features of the stimuli (see Figs. S5 and S6 at https://osf.io/f3kw6/) and under separate evaluation (see Fig. S7 at https://osf.io/f3kw6/).

Follow-up supplemental study. Comparing shame with sadness, we found a significant effect on norm acquisition but not on behavioral intentions. We conducted a preregistered follow-up study that focused only on this comparison. We manipulated whether an employee expressed shame or sadness about a workplace behavior, using different stimuli (e.g., text conversations between friends). We report this as

a

A confidential survey was done to assess employees' reactions to various things someone could do at their company (e.g., showing up five minutes late to a meeting, attending virtual conferences during the workday, etc.).

We asked 152 employees at SSP Partners to imagine that they engaged in various behaviors at SSP Partners (e.g., attended a virtual conference during the workday), and how they would feel about engaging in this behavior.

See an example below:

Imagine you did the following at SSP Partners:

Attended a virtual conference during the workday.

How would you feel?

| Anxious | Ashamed | Sad | Happy | Proud | Neutral / No emotion |

We provided employees with the following emotions.

Employees selected the emotion on the following scale that best captured how they would feel in response to the behavior.

For instance, in this example below, the participant indicated that "Attending a virtual conference during the weekday would make them feel "proud."

The employee's answer is in yellow.

| Anxious | Ashamed | Sad | Happy | **Proud** | Neutral / No emotion |

Page Break

Response for employee 83

Question

Imagine you did the following at SSP Partners:

Presented a very cautious estimate of growth in a board meeting.

Answer: *Presenting a very cautious estimate of growth in a board meeting would make me feel…*

| Anxious | **Ashamed** | Sad | Happy | Proud | Neutral / No emotion |

b

A confidential survey was done to assess employees' reactions to various things someone could do at their company (e.g., showing up five minutes late to a meeting, attending virtual conferences during the workday, etc.).

We asked 152 employees at SSP Partners to imagine that they engaged in various behaviors at SSP Partners (e.g., attended a virtual conference during the workday), and how they would feel about engaging in this behavior.

See an example below:

Imagine you did the following at SSP Partners:

Attended a virtual conference during the workday.

How would you feel?

We provided employees with the following emotions.

Employees selected the emotion on the following scale that best captured how they would feel in response to the behavior.

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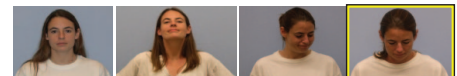

Fig. 3. Stimuli used to manipulate how an employee would feel engaging in different workplace behaviors in (a) Study 2 and (b) Study 3. The name of the company, the workplace behavior, and the employee's answer changed dynamically. In (b), the images are taken from the UC Davis Set of Emotion Expressions database (Tracy et al., 2009). The emotional expressions are, from left to right, neutral, pride, embarrassment, and shame. In Study 3, we had a scale of female faces (as shown here) and one with male faces. For the male-faces scale, see Figure S8 at https://osf.io/f3kw6/.

Study S1 at https://osf.io/unpq4/. Shame sent stronger information about social norms and led to lower behavioral intentions than sadness (see Table A1 at https://osf.io/unpq4/). Additional analyses showed that participants saw violating a norm as a stronger cause of shame than sadness but experiencing disappointment as a stronger cause of sadness than shame (see Table A2 at https://osf.io/unpq4/). This finding suggests that shame and sadness may affect
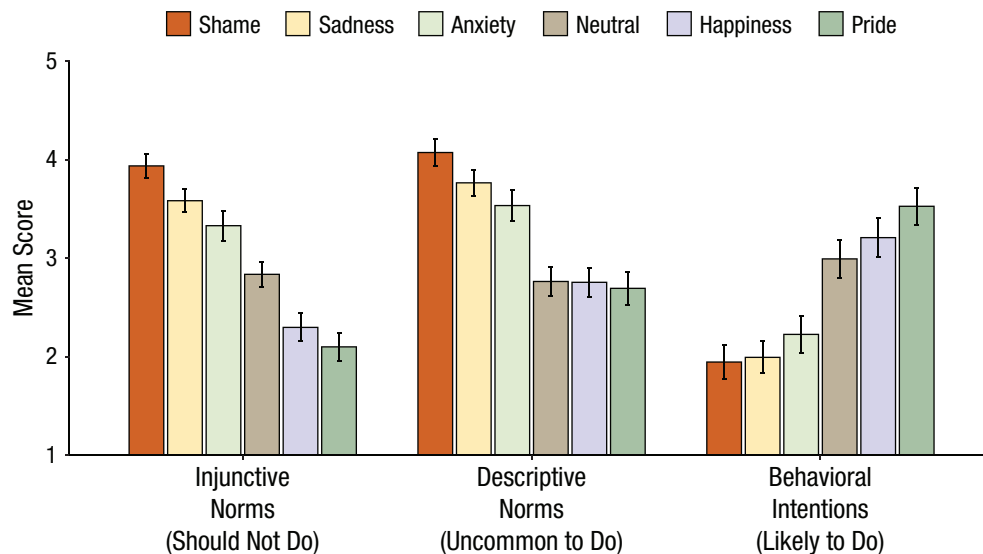
Fig. 4. Mean rating of perceived injunctive norms, descriptive norms, and behavioral intentions for each emotional expression made by the employee (Study 2). Error bars represent 95% confidence intervals.

observers' behaviors, but for different reasons—an idea we return to in the General Discussion.

Study 3

Study 3 had the same design as Study 2. However, we changed the response scale from emotion words to nonverbal expressions and scale options to shame, embarrassment, neutral, and pride. We compared shame with embarrassment to further assess the magnitude of shame's effects relative to other discrete negative emotions. Some scholars regard embarrassment as a less intense version of shame (e.g., Scheff, 2006). Other scholars see shame and embarrassment as arising from different sources. They reason that shame arises from moral failings and evokes disgust in other individuals, and embarrassment arises more from failings of social conventions (e.g., tripping) and arouses amusement in others (e.g., Keltner, 1995, 1996). Both these views suggest that shame would convey stronger signals of normative proscriptions than embarrassment.

Method

Participants. We posted a study to Prolific Academic for 500 U.S.-based participants to have approximately 125 participants (250 observations) per emotion. We anticipated smaller effects than what we observed in Study 2, given the changes we made to the study. After we followed our preregistered data-exclusion plan (see Table S1 at https://osf.io/unpq4/), the final sample consisted of 463 people (205 women, 255 men, two indicated a different

gender identity, one preferred not to state their gender; age: $M = 34.90$ years, $SD = 11.52$). We preregistered the study at https://aspredicted.org/ZZD_QDM.

Procedure. The study was identical to Study 2, except that we changed the emotion-response scale that the employees supposedly used to indicate how they would feel if they engaged in various workplace behaviors. We used images rather than emotion words on the scale (see Fig. 3b). Each image showed a person expressing an emotion (shame, embarrassment, or pride) or a neutral reaction. In this way, the response scale was akin to Kunin's Faces Scale, a widely used measure to assess job satisfaction (Kunin, 1955). We used validated images from the UC Davis Set of Emotion Expressions database to construct the emotion-response scale (Tracy et al., 2009).

Participants saw the responses from a single employee who reported how they would feel if they engaged in two different workplace behaviors. Participants saw which emotion, out of a set of four emotions, the employee selected in response to the behavior for each workplace behavior. For an example of the manipulation, see Figure 3. Participants answered the same dependent measures as in Study 2.

Results

Manipulation check. Before analyses, we excluded participants ($n = 34$) who incorrectly identified more than two emotional expressions from the response scale, per our preregistration. Most participants ($n = 277$, 60%) correctly identified all four emotional expressions. The

Table 3. Results of Regression Models Predicting Injunctive Norms, Descriptive Norms, and Behavioral Intentions From Emotional Expressions (Study 2)

| | Injunctive norms (should not do) | | | | | | Descriptive norms (uncommon to do) | | | | | | Behavioral intentions (likely to do) | | | | | |
| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | | Model 6 | | |
Predictor	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²	b (SE)	p	f²
Shame	1.10 (0.09)	< .0001	.16				1.31 (0.10)	< .0001	.19				-1.05 (0.13)	< .0001	.08			
Sadness	0.75 (0.09)	< .0001	.07	-0.35 (0.08)	< .0001	.02	1.00 (0.10)	< .0001	.11	-0.31 (0.09)	.001	.01	-1.00 (0.13)	< .0001	.07	0.05 (0.12)	.687	.00
Anxiety	0.49 (0.10)	< .0001	.03	-0.61 (0.10)	< .0001	.05	0.77 (0.11)	< .0001	.06	-0.54 (0.10)	< .0001	.03	-0.77 (0.14)	< .0001	.04	0.28 (0.13)	.025	.00
Neutral				-1.10 (0.09)	< .0001	.16				-1.31 (0.10)	< .0001	.19				1.05 (0.13)	< .0001	.08
Happiness	-0.54 (0.10)	< .0001	.04	-1.64 (0.10)	< .0001	.34	-0.01 (0.11)	.935	.00	-1.32 (0.10)	< .0001	.19	0.22 (0.14)	.120	.00	1.26 (0.14)	< .0001	.11
Pride	-0.74 (0.10)	< .0001	.07	-1.84 (0.10)	< .0001	.43	-0.07 (0.11)	.534	.00	-1.38 (0.11)	< .0001	.22	0.53 (0.13)	< .0001	.02	1.58 (0.13)	< .0001	.17
Constant	2.84 (0.06)	< .0001		3.94 (0.06)	< .0001		2.76 (0.07)	< .0001		4.07 (0.07)	< .0001		2.99 (0.10)	< .0001		1.95 (0.09)	< .0001	

Note: $N = 980$. Standard errors are adjusted for 490 clusters. Higher values equate to stronger proscriptions against the behavior (injunctive norms), less common behaviors (descriptive norms), and stronger intentions to engage in the behavior (behavioral intentions). Each emotion is a dummy variable. Models 1, 3, and 5 compare the discrete emotions with a neutral expression. Models 2, 4, and 6 compare shame with the other discrete emotions and a neutral expression. For the raw mean and standard deviation of each measure for each emotion, see Table S2 at https://osf.io/f3kw6/.
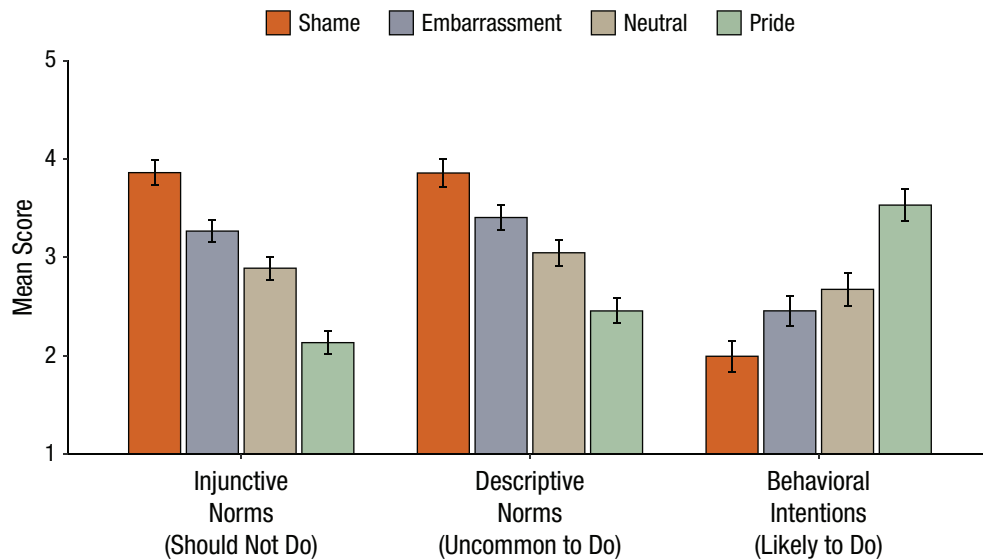
Fig. 5. Mean rating of perceived injunctive norms, descriptive norms, and behavioral intentions for each emotional expression made by the employee (Study 3). Error bars represent 95% confidence intervals.

other participants correctly identified three ($n = 113$, 24%) and two ($n = 73$, 16%) emotional expressions.

Analysis. We followed the same analysis plan as in the previous studies. Each participant answered questions about two behaviors, so the total number of observations for analyses was 926. In each regression model, we regressed one of the dependent variables on three of the four emotions. We clustered standard errors by participant.

Hypothesis tests. Figure 5 shows mean differences in the dependent variables across conditions (shame, embarrassment, neutral, pride). Table 4 shows the regression results.

Participants inferred that a workplace behavior was less normative when an employee conveyed shame than embarrassment, a neutral expression, or pride (see Table 4, Model 2 for injunctive norms and Model 4 for descriptive norms). Participants also had lower behavioral intentions when the target expressed shame than embarrassment, had a neutral reaction, or expressed pride (see Table 4, Model 6).

These results were consistent across the sampled stimuli (see Figs. S9–S11 at https://osf.io/f3kw6/) and under separate evaluation (see Fig. S12 at https://osf.io/f3kw6/). Thus, Study 3 conceptually replicated the previous results.

Study 4

Study 4 assessed how seeing someone else feel ashamed affects incentivized behavior. Participants completed an asynchronous competitive group task that involved

generating rhymes. Participants saw a previous participant select a rhyme booster, which provided a personal advantage in a rhyming task. We varied whether this previous participant expressed shame (or reacted neutrally) to selecting a rhyme booster. We predicted that participants would be less likely to use a rhyme booster when they saw the previous participant express shame about using it because participants would infer that using a rhyme booster is normatively inappropriate.

Method

Participants. A power analysis showed that we would need 519 participants per condition for 90% power (assuming a base rate of 50%). We posted a study to Amazon Mechanical Turk for 1,050 U.S.-based participants. The final sample consisted of 953 people (533 women, 408 men, seven indicated a different gender identity, and five did not indicate their gender; age: $M = 41.42$ years, $SD = 12.56$; for exclusion criteria, see Table S2 at https://osf.io/unpq4/). We preregistered the study at https://aspredicted.org/MVT_79D.

Procedure. The goal of Study 4 was to assess how participants would behave when seeing someone's emotional reaction to their behavior. All participants were given the same information and witnessed the target make the same decision. The only difference across conditions was whether the target expressed shame or had a neutral expression in response to their decision.

Participants learned that they would complete an asynchronous group decision-making task. In the task, participants would receive a focal word (e.g., "chin")

Table 4. Results of Regression Models Predicting Injunctive Norms, Descriptive Norms, and Behavioral Intentions From Emotional Expressions (Study 3)

| | Injunctive norms (should not do) | | | | | | Descriptive norms (uncommon to do) | | | | | | Behavioral intentions (likely to do) | | | | | |
| | Model 1 | | | Model 2 | | | Model 3 | | | Model 4 | | | Model 5 | | | Model 6 | | |
Predictor	b (SE)	p	f^2	b (SE)	p	f^2	b (SE)	p	f^2	b (SE)	p	f^2	b (SE)	p	f^2	b (SE)	p	f^2
Shame	0.97 (0.09)	< .0001	.16				0.81 (0.09)	< .0001	.10				−0.68 (0.11)	< .0001	.05			
Embarrassment	0.38 (0.08)	< .0001	.03	−0.59 (0.08)	< .0001	.06	0.36 (0.09)	< .0001	.02	−0.45 (0.09)	< .0001	.03	−0.22 (0.11)	.056	.01	0.46 (0.11)	< .0001	.02
Neutral				−0.97 (0.09)	< .0001	.16				−0.81 (0.09)	< .0001	.10				0.68 (0.11)	< .0001	.05
Pride	−0.76 (0.09)	< .0001	.09	−1.73 (0.09)	< .0001	.48	−0.59 (0.09)	< .0001	.05	−1.40 (0.09)	< .0001	.28	0.86 (0.12)	< .0001	.07	1.54 (0.12)	< .0001	.22
Constant	2.89 (0.06)	< .0001		3.86 (0.07)	< .0001		3.05 (0.07)	< .0001		3.86 (0.07)	< .0001		2.68 (0.08)	< .0001		2.00 (0.08)	< .0001	

Note: N = 926. Standard errors are adjusted for 463 clusters. Higher values equate to stronger proscriptions against the behavior (injunctive norms), less common behaviors (descriptive norms), and stronger intentions to engage in the behavior (behavioral intentions). Each emotion is a dummy variable. Models 1, 3, and 5 compare a neutral expression with all discrete emotions. Models 2, 4, and 6 compare shame with the other emotions and a neutral expression. For the raw mean and standard deviation of each measure for each emotion, see Table S3 at https://osf.io/f3kw6/.
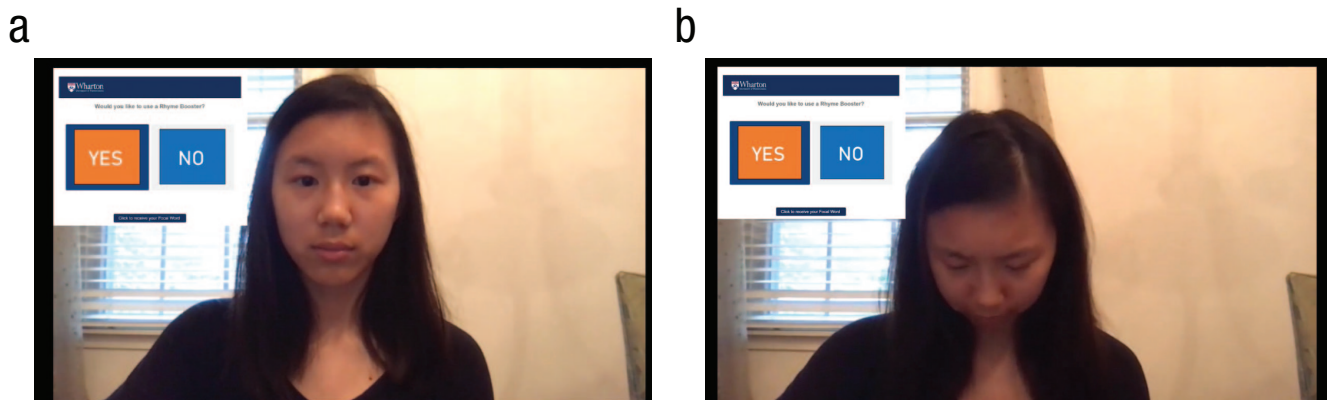
a

b

Fig. 6. Screenshots from the video recording used to manipulate a target's reaction to using a rhyme booster (Study 4). Participants in the neutral-expression condition saw the actor have a neutral expression to their choice to use a rhyme booster (a). Participants in the shame-expression condition saw the actor express shame to their choice to use a rhyme booster (b).

and have a specified time to generate English words that rhymed with the focal word (e.g., "grin," "fin," "sin"). We told participants that they were joining a group of university students. We further explained that the other group members recently completed a round of the task synchronously as part of a virtual study in our university's research lab. As part of this previous round, the group members agreed to be recorded (we assured participants that they would not be recorded in the asynchronous round).

Participants learned that the group had four members. They would join the group as the new Group Member 4. As a new group member, participants learned that part of their job was to make sense of the decisions and experiences of their group. To help them do this, participants would watch a video of the former Group Member 4 and see their decisions in the previous synchronous round of this task.

Participants then received information about their bonus payment and the option to use a rhyme booster. We told participants that if they submitted the most rhymes in the group, they would earn a bonus of $0.25. If they did not submit the most rhymes in the group, they would earn a bonus of $0.15.

We then explained that participants would have the opportunity to use a rhyme booster. Participants' choice to use a rhyme booster was the focal behavioral outcome in the study. We explicitly stated that "using a rhyme booster can give you an advantage. It can help you to generate the most rhymes." We assured participants that the group would not know them, but that the group would learn whether the participant used a rhyme booster.

Manipulation. After answering six multiple-choice comprehension-check questions, participants watched a

video of the previous synchronous round of the task. In the video, participants shadowed Group Member 4. They saw Group Member 4 decide to use a rhyme booster. They received no information about the other group members' decisions to use a rhyme booster. We did not show Group Member 4 generating the rhymes, but we told participants that Group Member 4 generated eight rhymes and that the other group members generated fewer than five rhymes. Thus, Group Member 4 generated the most rhymes in the group.

Participants then learned that the other group members' decisions to use a rhyme booster were revealed to Group Member 4 at the end of the round. Participants then saw how Group Member 4 reacted after they learned this information. Participants in the shame-expression condition ($n = 479$) saw Group Member 4 nonverbally express shame. Participants in the neutral-expression condition ($n = 474$) saw Group Member 4 have a neutral expression. Figure 6 provides screenshots of these two reactions. A complete storyboard of the video that participants watched is in Figure S13 at https://osf.io/f3kw6/ (for the videos, see https://osf.io/42y7v/).

After watching the video, participants answered questions about the norms in the group. They then indicated whether they would like to use a rhyme booster (our focal behavioral outcome variable). After making this decision, participants proceeded to the rhyme-generation page. They had 30 s to generate as many rhymes as possible with a focal word.

After submitting their rhymes, participants concluded the study by answering a manipulation check about Group Member 4's emotional reaction and an open-ended question regarding any comments or concerns.

Stimuli. We had three actors (two female and one male) record themselves expressing both shame and a

neutral expression (for an example, see Fig. 6). We randomly assigned each participant to watch one of these three actors play Group Member 4. A separate group of actors played Group Members 1, 2, and 3 and were held constant across conditions. We conducted two pilot tests to validate the actors' emotional expressions. These pilot tests showed that participants most commonly saw the actor's expression as shame. We report the results of these validation tests in Tables S4 to S6 at https://osf.io/f3kw6/. The validity of our stimuli is further supported by the manipulation checks conducted at the end of each study.

Behavior (using a rhyme booster). We aligned the financial incentive with the behavior of the target (i.e., using a rhyme booster). Participants earned a $0.25 bonus for generating the most rhymes in the group (and $0.15 if they did not). A rhyme booster provided an advantage for generating rhymes.

Injunctive norms. Participants answered two questions about the group's injunctive norms regarding rhyme booster s: (a) "In this group, is it more acceptable to use a Rhyme Booster or not to use a Rhyme Booster?" and (b) "In this group, is it more wrong/inappropriate to use a Rhyme Booster or not to use a Rhyme Booster?" Participants answered the questions on 3-point scales. We combined these two measures to create a composite measure. Participants received a score of 1 if they indicated that using a rhyme booster was more wrong/inappropriate and that not using a rhyme booster was more acceptable. We assigned a value of 0 to all other participants. We treated participants with a score of 1 as seeing stronger injunctive norms against using a rhyme booster.

Descriptive norms. Participants indicated whether they thought each group member did or did not use a rhyme booster. We totaled the number of group members that participants believed did not use a rhyme booster. The range of this measure is 0 to 3; higher values indicate that using a rhyme booster is less common.

Rhyming performance. Participants had 30 s to generate English words that rhymed with a focal word (e.g., "lamp"). We gave participants 13 text boxes to type their rhymes. For participants who chose to forgo a rhyme booster, all 13 text boxes were blank at the start of the task. The first four boxes were populated with four free rhymes for participants who chose a rhyme booster. Although participants knew that using a rhyme booster would give them an advantage, this specific benefit of receiving four free rhymes was unknown to participants when they chose to use a rhyme booster.

Manipulation check. Participants saw a screenshot of Group Member 4's emotional reaction from the video manipulation. We asked participants, "Would you say Group Member 4 is experiencing an emotion or is in more of a neutral state?" (responses were "experiencing an emotion" and "more in a neutral state"). Participants who indicated that Group Member 4 was experiencing an emotion selected the emotion that Group Member 4 was experiencing ("happiness," "anger," "shame," "sadness").

Results

Suspicion. At the end of the study, we asked participants to state any comments or concerns they had about the study. About one third of participants (n = 349) commented on the study, but only five reported suspicion about the authenticity of the situation.

Manipulation check. Nearly all participants correctly identified the target's emotional expression; 91% of participants assigned to the neutral-expression condition indicated that the target was in a neutral state, and 89% of participants assigned to the shame-expression condition indicated that the target was experiencing shame. The results of the primary analyses remained the same if we included only the participants who accurately identified the actor's expression as shame (see Table S3 at https://osf.io/unpq4/).

Behavior (using a rhyme booster). As shown in Figure 7, when participants saw someone react neutrally to using a rhyme booster (neutral-expression condition), 48% of participants chose to use a rhyme booster. However, when participants saw someone express shame about using a rhyme booster (shame-expression condition), 37% of participants chose to use a rhyme booster, $\chi^2(1, N = 953) = 12.12$, $p < .0001$, $d = 0.23$, 95% confidence interval (CI) = [0.10, 0.35]. In exploratory analyses, we found a similar pattern of results for each actor (see Fig. S14 at https://osf.io/f3kw6/).

Injunctive norms. More participants in the shame-expression condition (67%) perceived an injunctive norm against using a rhyme booster relative to those in the neutral-expression condition (34%), $\chi^2(1, N = 953) = 108.10$, $p < .0001$, $d = 0.71$, 95% CI = [0.58, 0.85] (see Fig. S15 at https://osf.io/f3kw6/).

Descriptive norms. On average, participants in the shame-expression condition believed that more nontarget group members chose not to use a rhyme booster ($M = 2.72$, $SE = 0.04$) relative to participants in the
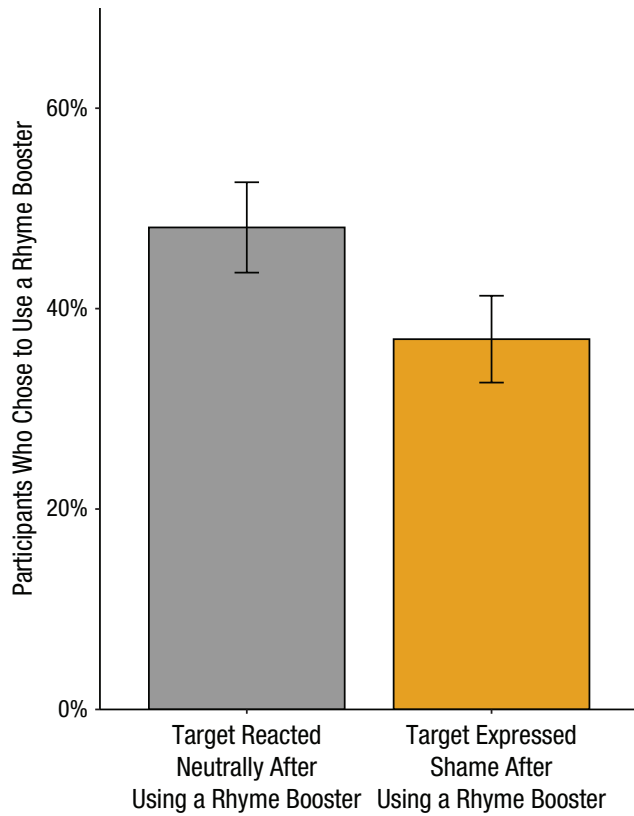
Fig. 7. Percentage of participants who chose to use a rhyme booster after viewing a video in which the target reacted shamefully or neutrally to using a rhyme booster (Study 4). Error bars represent 95% confidence intervals.

at https://osf.io/f3kw6/). Thus, participants saw the target's behavior as less common when the target expressed shame.

Mediation. We tested whether participants' perceptions of the injunctive and descriptive norms in the group mediated the effect of emotional expression on participants' incentivized choice. We used 5,000 bootstrapped resamplings of the data to estimate the indirect effects of the mediators simultaneously (Preacher & Hayes, 2008; UCLA: Statistical Consulting Group, 2021). As shown in Figure 8, we found that both the indirect effect of injunctive norms ($b = -0.05$, $SE = 0.01$, $p < .0001$, 95% CI = [−0.07, −0.02]) and the indirect effect of descriptive norms ($b = -0.04$, $SE = 0.01$, $p < .0001$, 95% CI = [−0.06, −0.02]) mediated the effect of emotional expression on participants' choice. Together, the total indirect effects mediated 72% of the total effect.

Advantage of using a rhyme booster. We told participants that a rhyme booster would give them an advantage in the task. The rhyme booster worked as intended. We had three undergraduate students complete the study to represent the performances of Group Members 1, 2, and 3. These students did not use a rhyme booster. The top-performing student submitted six rhymes. Participants who submitted more than six rhymes received a $0.25 bonus. All other participants got a $0.15 bonus. Sixty-five percent of participants who used a rhyme booster and 32% of participants who did not use a rhyme booster earned a $0.25 bonus, $\chi^2(1, N = 953) = 104.48$, $p < .0001$, $d = 0.71$, 95% CI = [0.58, 0.84] (for details, see Fig. S17 at https://osf.io/f3kw6/).

neutral-expression condition ($M = 2.29$, $SE = 0.05$), $t(951) = 6.75$, $p < .0001$, $d = 0.44$, 95% CI = [0.31, 0.57] (see Fig. S16
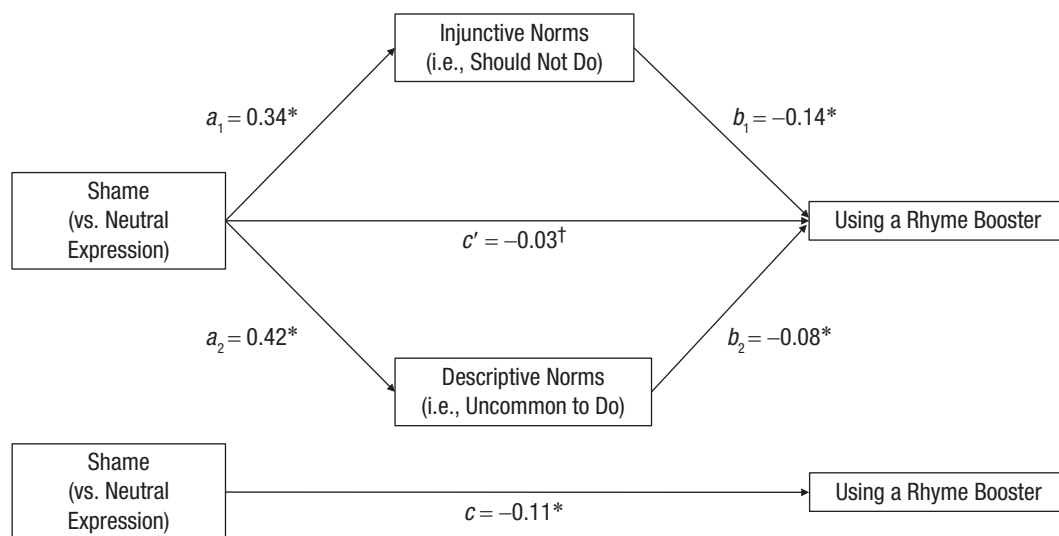

Fig. 8. Mediation analysis showing the effect of the target's emotional expression on participants' incentivized behavior (choosing whether or not to use a rhyme booster) via perceived injunctive and descriptive norms (Study 4). Unstandardized coefficients are shown. Symbols indicate nonsignificant ($^\dagger p > .10$) and significant ($^*p < .001$) paths.

Discussion

Study 4 provided evidence that people adjust their behavior when witnessing someone express shame, even if this adjustment is financially disadvantageous. Participants were less likely to use a rhyme booster in a competitive rhyming task when they observed someone express shame for using one because this person's shame signaled that using a rhyme booster was normatively inappropriate.

Study 5

Study 5 was similar to Study 4. However, we told participants the precise financial cost of avoiding the target's choice and changed the focal behavior to ensure that participants had no prior beliefs about the appropriateness or inappropriateness of the behavior.

Method

Participants. A power analysis suggested that we would have 90% power to detect an estimated 10-percentage-point effect with 260 participants per condition (assuming a base rate of 10%). We posted a study to Prolific Academic for 650 U.S.-based participants because we expected that some participants would be excluded (see Table S2 at https://osf.io/unpq4/). The final sample consisted of 527 people (240 women, 281 men, five indicated a different gender identity, and one did not indicate their gender; age: $M = 33.55$ years, $SD = 11.79$). We preregistered the study at https://aspredicted.org/JAB_EJX.

Procedure. The procedure was similar to that of Study 4. Participants again learned that they would complete an asynchronous group decision-making task. However, instead of completing a rhyming task and choosing whether to use a rhyme booster, participants saw two different ovals. The ovals had different monetary values associated with them. The focal behavior was which oval participants chose (for an example, see Fig. 9).

Following a similar procedure as in Study 4, we showed participants a video recording supposedly of previous rounds of the task. Participants again learned that they would participate asynchronously as Group Member 4 and shadow Group Member 4 before each round.

Participants completed two rounds of the task. In both rounds, the task involved choosing between ovals (see Fig. 9). The ovals were the same color, but they appeared to be two different colors (i.e., a Munker illusion; see Novick, 2017). In both rounds, participants saw how Group Member 4 reacted when their decisions were publicized to the group. After each round, participants logged their incentivized decision for that round. A complete storyboard of the videos that participants watched is in Figure S18 at https://osf.io/f3kw6/ (for the videos, see https://osf.io/42y7v/).

The purpose of the first round was to familiarize participants with the task. In Round 1, Group Member 4 always selected "BLUE" and had a neutral expression after their selection. In Round 2, Group Member 4 also selected "BLUE". However, in this round, we manipulated Group Member 4's emotional expression. Participants in the shame-expression condition ($n = 255$) saw Group Member 4 express shame about their choice. Participants in the neutral-expression condition ($n = 272$) saw Group Member 4 react neutrally to their choice. Participants' choice of "BLUE" or "RED" in the second round was our primary dependent variable.

a

The ovals are the same color. What color do you see?
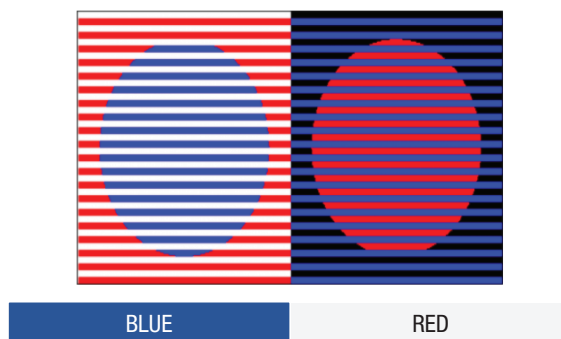
b

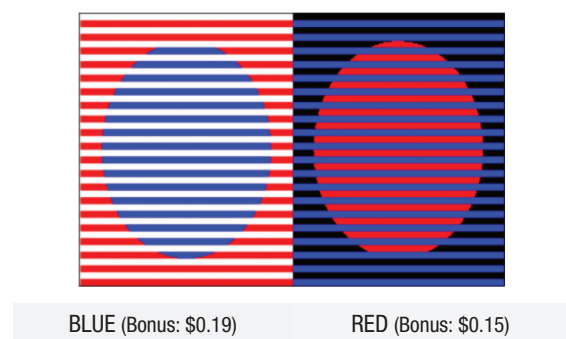The ovals are the same color. What color do you see?

Fig. 9. Focal behavior (Study 5). Panel (a) shows Group Member 4's focal choice. Group Member 4 always selected "BLUE." Panel (b) shows the choice presented to participants.

Manipulation. We used the same videos from Study 4 to manipulate whether the target expressed shame or reacted neutrally to choosing "BLUE." However, we also included a fourth video of a second male actor. We randomly assigned each participant to watch one of these four actors play Group Member 4.

Behavior (choosing "BLUE"). To assess how the emotional expression of the target affected participants' behavior, we told participants that they would earn $0.19 if they selected "BLUE" and $0.15 if they selected "RED." The incentives were stated directly below the question so that participants knew the precise financial implications of their decision (see Fig. 9). Following a similar procedure as in Study 4, we incentivized participants to select the target's choice (i.e., "BLUE") so that the financial incentive aligned with the observed behavior. With these incentives, we would expect most participants to select "BLUE" unless they inferred some other cost for selecting "BLUE" and wanted to avoid this cost.

Injunctive norms. We measured participants' perceptions of the injunctive norms in the group about choosing "BLUE" or "RED." We asked participants the same two questions used in Study 4, substituting choosing "RED" or "BLUE" for not using or using a rhyme booster. We combined these two measures again to create a binary measure of perceived injunctive norms against the target's behavior (choosing "BLUE").

Descriptive norms. As in Study 4, participants indicated whether they thought each of the other three nontarget group members selected "BLUE" or "RED." We again totaled the number of group members that participants believed selected "RED" (i.e., the target's forgone choice); thus, higher values indicate that participants see choosing "BLUE" (the target's choice) as more uncommon.

Manipulation check. Participants answered the same manipulation-check question from Study 4 about the target's emotional reaction.

Results

Manipulation check.
Participants accurately identified the emotions; 87% of participants in the neutral-expression condition indicated that Group Member 4 was in a neutral state. Similarly, 59% of participants in the shame-expression condition correctly identified the actor's expression of shame. Of the participants in the shame-expression condition who misidentified the actor's expression, most identified the actor's expression as sadness (for details, see https://osf.io/f3kw6/). We note that the results of the primary analyses remained the same if

we included only the participants who accurately identified the target's emotion as shame (see Table S3 at https://osf.io/unpq4/).

Behavior (choosing "BLUE").
As shown in Figure 10, in line with the financial incentive, 89% of participants in the neutral-expression condition selected "BLUE," the financially advantageous choice. However, 71% of participants selected "BLUE" in the shame-expression condition. Overall, participants in the shame-expression condition were about 3 times more likely than those in the neutral-expression condition to select the financially disadvantageous option of "RED," the target's forgone choice, $\chi^2(1, N = 527) = 25.92, p < .0001, d = 0.45, 95\%$ CI $= [0.28, 0.63]$. In an exploratory analysis, we found this pattern of results to be consistent across individual actors (see Fig. S19 at https://osf.io/f3kw6/).

Injunctive norms.
More participants in the shame-expression condition (45%) perceived an injunctive norm against the target's choice, "BLUE," relative to those assigned to the neutral-expression condition (13%), $\chi^2(1, N = 527) = 70.35, p < .0001, d = 0.78, 95\%$ CI $= [0.61, 0.96]$ (see Fig. S20 at https://osf.io/f3kw6/).

Descriptive norms.
On average, participants in the shame-expression condition believed that most of the other three group members selected "RED," the target's forgone choice ($M = 2.07, SE = 0.07$). Participants in the neutral-expression condition believed that the minority of the other three group members did the same ($M = 1.29, SE = 0.07$), $t(525) = 7.80, p < .0001, d = 0.68, 95\%$ CI $= [0.50, 0.86]$ (see Fig. S21 at https://osf.io/f3kw6/). Thus, participants saw the target's behavior as less common when the target expressed shame.

Mediation.
We used the same multiple mediation model used in Study 4 to test whether participants' perceptions of the injunctive and descriptive norms in the group mediated the effect of emotional expression on participants' incentivized choice. As shown in Figure 11, we replicated the mediation effects identified in Study 4. Both the indirect effect of injunctive norms ($b = -0.05, SE = 0.02, p = .010, 95\%$ CI $= [-0.09, -0.02]$) and the indirect effect of descriptive norms ($b = -0.06, SE = 0.01, p < .0001, 95\%$ CI $= [-0.09, -0.03]$) mediated the effect of emotional expression on participants' choice. Together, the total indirect effects mediated 64% of the total effect.

Discussion

Study 5 replicated Study 4 using a different behavior with precise financial incentives. Although the financial
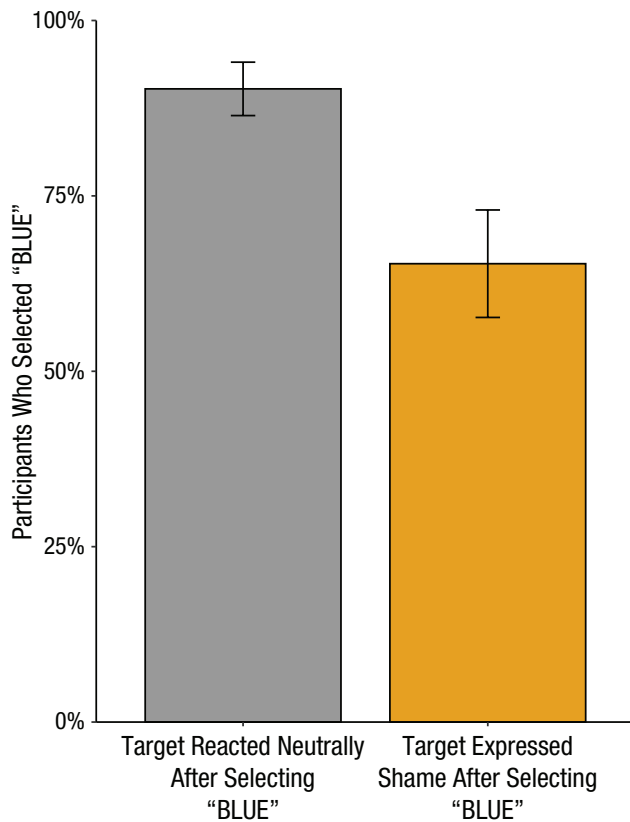
Fig. 10. Percentage of participants who selected "BLUE" after watching the target reacted shamefully or neutrally after selecting "BLUE" (Study 5). Error bars represent 95% confidence intervals.

incentives in this study were small, this is an anonymous online setting in which financial compensation is the primary motivation for study participation. Yet participants were more likely to choose a smaller bonus when they observed another person express shame for making a more lucrative choice.

In Studies 4 and 5, participants answered questions about perceived injunctive and descriptive norms before making their incentivized choice. To ensure that the findings did not depend on this design feature, we conducted a preregistered replication of Study 5, omitting the questions regarding injunctive and descriptive norms (for full details, see Study S2 at https://osf.io/unpq4/). We found that participants were significantly more likely to avoid the target's behavior (choosing "BLUE") when the target expressed shame. This suggests that the results are not driven by assessing the mediators before the focal behavioral dependent variable.

General Discussion

Across studies, participants inferred a group's norms—both what people in the group should do and commonly do—from other people's shame expressions. Moreover, when witnessing someone express shame in response to a behavior, participants were less likely to engage in the behavior. These findings show that shame broadcasts strong signals of normatively appropriate behavior, providing the first evidence of how one person's shame affects the normative behavior of others. In doing so, these findings identify social learning as a key mechanism through which shame positively affects social cohesion.
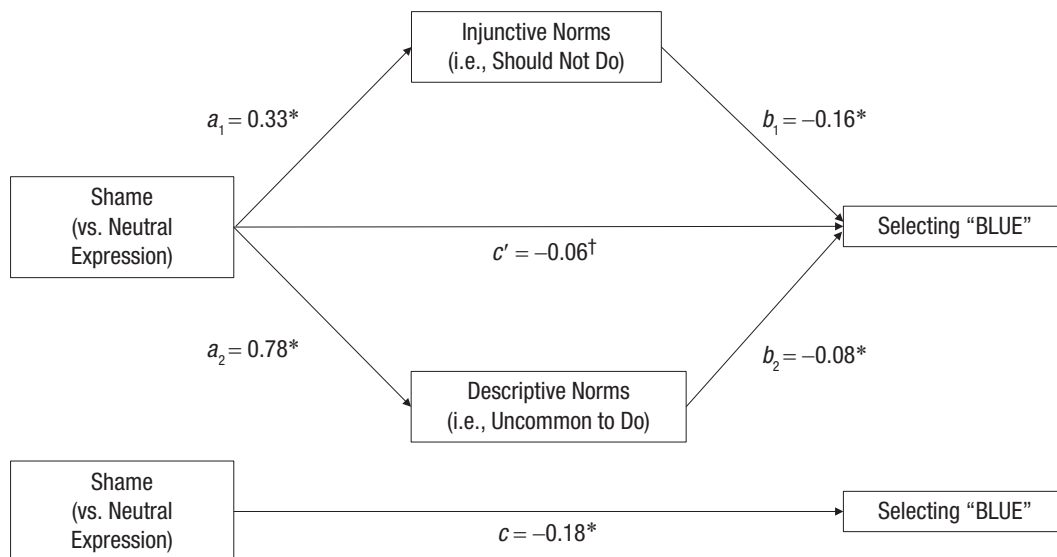

Fig. 11. Mediation analysis showing the effect of the target's emotional expression on participants' incentivized behavior (choosing whether or not to select "BLUE") via perceived injunctive and descriptive norms (Study 5). Unstandardized coefficients are shown. Symbols indicate nonsignificant ($^\dagger p > .10$) and significant ($^* p < .001$) paths.

We speculate that past research on shame may have overlooked shame's role in norm acquisition and inter-individual behavior regulation for two reasons. First, people are socialized not to show or discuss shame in modern, Western societies (Fessler, 2004; Scheff, 1988; Tracy & Matsumoto, 2008). Second, the contemporary study of shame often treats shame as a feature of a person rather than a feature of a situation or transgression (e.g., Tangney et al., 2007a). Thus, this view may assume that observers could learn little about the social environment from a person's experience of shame.

The present findings suggest that the expression of shame facilitates norm acquisition and normative behavior in other individuals. From a genetic evolutionary perspective, this is not the primary function for which the shame expression evolved (see Fessler, 2007; Keltner & Harker, 1998). However, it may be a secondary adaptive benefit of the shame expression because it supports the transmission of critical cultural information (Boyd et al., 2011; for a similar discussion regarding pride, see Tracy et al., 2020).

Scholars have theorized that the primary function of the shame expression is to appease higher status or more dominant individuals, thereby reducing punishment for one's transgressions (Fessler, 2007; Giner-Sorolla et al., 2008; Keltner, 1995; Martens et al., 2012). Whereas appeasement reduces threats against the self and resolves conflict, it also lowers one's social status. People are highly motivated to avoid actions that would cause them to lose status (Pettit et al., 2010) because of the benefits of being conferred high status (Anderson et al., 2015). Consequently, people would benefit from recognizing and learning from others' shame because this capability would allow people to avoid engaging in shameful behaviors. Thus, over time, individuals who were more attuned to others' shame expressions and the normative information the expression conveyed may have fared better than those who were not.

The association between shame and lower status suggests another mechanism by which witnessing other individuals' shame expressions could affect observers' behavior. Individuals may avoid ashamed others' behaviors because the shame expression signals that the person is less competent, and thus, copying their behavior would undermine the observer's performance (see Martens & Tracy, 2013). However, the data from Study 4 counter this view. In Study 4, the target performed the best in their group and earned the most money. If participants were motivated to copy the behaviors that would afford them the most individual success, they would have copied the target's victorious behavior. Instead, participants were less likely to copy the target's behavior when the target expressed shame because participants inferred that the target's behavior was normatively inappropriate.

We relied on U.S.-based samples, which may limit the generalizability of the findings. Given the relatively low elaboration of the shame concept in the United States (Scheff, 2014), it is unclear whether the findings would extend beyond this cultural context. The effects could be stronger in a cultural context with a more elaborated view of shame because there is higher cultural awareness about the meaning of shame (e.g., Fessler, 2004). In contrast, shame may send particularly strong signals of social-norm violations in the United States because people rarely express shame. Identifying whether a more elaborated cultural understanding of shame would moderate the present findings is an important question for future research.

Our results show that shame reliably sent stronger signals of social norms compared with anger, anxiety, sadness, and embarrassment, suggesting that shame is at least quantitatively different from many other negative emotions. However, whether the normative information that shame signals is qualitatively different from these other negative emotions remains an open question. On the one hand, in Studies 1 to 3, embarrassment, anxiety, anger, and sadness conveyed normative information about a behavior relative to a neutral expression, suggesting a difference in magnitude. On the other hand, in Study S1, participants saw shame and sadness as having different antecedent causes, suggesting a difference in kind. We suggest that future work would benefit from further comparing shame with other discrete emotions to flesh out the functions of shame that are unique or shared with similar emotions.

An interesting direction for future work is to assess how shame influences social norms and whether people's conveyance of shame is a tool for changing social norms. For instance, if people stop conveying shame in response to violating a social norm, does this diminish the strength of the social norm? Conversely, if people start expressing shame in response to what was previously considered an innocuous behavior, does this create a new norm? The present findings provide foundational evidence about shame that allows future research to address these types of questions. Understanding these questions is critical because, as Scheff (2014) argued, "Shame may be one of the keys to understanding our civilization" (p. 129).

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Notes

1. A Nexis Uni search showed that 20% of articles published about shame in *The New York Times* from 1980 to 2020 were published in the last 3 years.
2. Studies 1 to 3 are presented in the chronological order in which they were conducted. Studies 4, S1, and S2 were conducted after Study 5.
3. In Studies 1 to 3, the names of the employee and the company varied for stimulus-sampling purposes (for details, see https://osf.io/unpq4/).

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