

## Immediacy Bias in Social-Emotional Comparisons

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In seven studies of naturally occurring, “real-world” emotional events, people demonstrated an immediacy bias in social-emotional comparisons, perceiving their own current or recent emotional reactions as more intense compared with others’ emotional reactions to the same events. The events examined include crossing a scary bridge (Study 1a), a national tragedy (Study 1b), terrorist attacks (Studies 2a and 3b), a natural disaster (Study 2b), and a presidential election (Study 3b). These perceived differences between one’s own and others’ emotions declined over time, as relatively immediate and recent emotions subsided, a pattern that people were not intuitively aware of (Study 2c). This immediacy bias in social-emotional comparisons emerged for both explicit comparisons (Studies 1a, 1b, and 3b), and for absolute judgments of emotional intensity (Studies 2a, 2b, and 3a). Finally, the immediacy bias in social-emotional comparisons was reduced when people were reminded that emotional display norms might lead others’ appearances to understate emotional intensity (Studies 3a and 3b). Implications of these findings for social-emotional phenomena are discussed.

*Keywords:* immediacy bias, social comparison, affect, emotion, judgment, perception

I measure every grief I meet

With analytic eyes;

I wonder if it weighs like mine,

Or has an easier size.

—Emily Dickinson (1924)

Dickinson’s poem describes a grieving protagonist wondering whether others’ grief is as intense as her own. She wonders, in particular, whether others’ grief might be less painful, having an “easier size,” than her grief, which she suspects may weigh more heavily in intensity. These wonderings hint at a question central to everyday emotional experience in social contexts: How does the intensity of one’s own emotions compare with the intensity of others’ emotions?

The perception of how intense one’s own emotions are compared with others’ emotions is a recurring and central theme in social emotion perception. People’s perception that their own distress about potential emergency situations is stronger than others’ distress is one reason why people fail to intervene in emergency situations (Latané & Darley, 1970). People’s perception that they are more concerned about potentially harmful social norms compared with other people is one reason why people conform to

social norms in public that they reject in private (Prentice & Miller, 1996). The belief that one’s own emotions are more intense than others’ emotions may be particularly pronounced for self-conscious emotions—which are often privately experienced and publicly concealed—such as fear of embarrassment (Sabini, Cosmas, Siepmann, & Stein, 1999; Sabini, Seipmann, & Stein, 2001), concerns about appearing politically incorrect (Van Boven, 2000), and other self-relevant anxieties (McFarland & Miller, 1990; Miller & McFarland, 1987). These various strands of social psychological research imply that people generally perceive their own emotions as more intense than others’ emotions, and that these perceptions can have profound and diverse consequences for social behavior.

Our thesis is that the tendency to perceive one’s own emotions as more intense than others’ emotions is transient—that the perceived difference in emotional intensity between the self and others is pronounced when emotions are immediately experienced or recently past. Specifically, we suggest that people exhibit an “immediacy bias” in social-emotional comparisons such that the tendency to perceive their own emotions as more intense than others’ emotions diminishes over time. We sought to test this novel pattern in social-emotional perceptions in the present research. The possibility of an immediacy bias in social-emotional comparisons could have important implications for other psychological phenomena that derive from people’s perception of differences between the intensity of their own and others’ emotions, including, among others, bystander nonintervention (Latané & Darley, 1970), pluralistic ignorance (Prentice & Miller, 1996), the impostor phenomenon (Clance, 1985; Clance & Imes, 1978), and general underestimation of social pressures surrounding conformity and obedience to authority (Sabini et al., 1999; Sabini et al., 2001).

The hypothesis that people exhibit an immediacy bias in social-emotional comparisons is derived from two empirical observations and their related psychological explanations. First, as just reviewed, several strands of research imply that people perceive and

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believe that their own emotions are more intense than others' emotions. Explanations for these self-other differences are often based on the fact that perceptions of one's own emotions are based on different information than perceptions of others' emotions. Whereas people perceive their own emotions through introspection—even if such introspection is inaccurate (Seager, 2003; Wilson & Gilbert, 2003) if not illusory (Bem, 1972; Gopnik, 1993)—people perceive others' emotions based largely on others' external appearances. People believe that others' appearances, particularly others' facial expressions, reliably convey information about emotional intensity (Barr & Kleck, 1995; Ekman & Oster, 1979; Friedman, Ekman, & Oster, 1987). Although it is true that external appearances reliably convey information about the quality, or kind, of emotion experienced (Adelman & Zajonc, 1989; Ekman, 1993; Rosenberg & Ekman, 1994), those appearances may understate others' emotional intensity. People often rein in their emotional displays in adherence to social norms such that their external emotional appearances understate the intensity of their private emotional experiences (Kleck et al., 1976; Kraut, 1982; Lanzetta, Cartwright-Smith, & Kleck, 1976; Matsumoto, 1993; Yarczower, 1979). The contrast between people's own relatively intense internal experience and others' more moderate external appearance can foster a tendency, when making social-emotional comparisons, to perceive one's own emotions as more intense than others' emotions.

Second, the hypothesized immediacy bias in social-emotional comparisons is also based on our own recent research demonstrating that people perceive their own immediate and relatively recent emotions as more intense than their own distant emotions (Van Boven, White, & Huber, 2009). Two related processes contribute to the immediacy bias in people's perceptions of their own emotions over time. One is that immediate emotions capture and hold attention (Anderson, 2005; Derryberry & Tucker, 1994; Ohman, Flykt, & Esteve, 2001), increasing the salience of immediate emotions, engendering a perceptual contrast that makes previous emotions seem less intense than they would have otherwise. Another reason is that information about immediate emotions is more cognitively available than information about previous emotions (Kensinger & Corkin, 2003; Kensinger, Garoff-Eaton, & Schacter, 2006; Mather & Knight, 2008), and people may use the availability of emotional information as a heuristic to perceive emotional intensity (Schwarz & Vaughn, 2002; Tversky & Kahneman, 1974). Importantly, because these processes of emotional salience and emotional availability are influenced by immediate emotional arousal, they diminish over time. Once an emotion has passed, that particular emotional episode no longer seems more intense than more distant emotions (Van Boven, et al., 2009, Study 5).

The prediction that people exhibit an immediacy bias in social-emotional comparisons naturally follows from these two processes, the tendency to compare internal experiences with external appearances, and the transient tendency for immediate emotions to seem more intense than previous emotions. Just as immediately experienced and very recent emotions seem more intense than one's own relatively distant emotions, immediately experienced and recent emotions may seem more intense than others' emotions. Because people's own emotions seem less intense over time whereas other people's external appearances seem relatively stable over time, the tendency to perceive one's own emotions as more intense than others' emotions should diminish over time. And

because information about one's own immediate emotions is more cognitively available than information about others' emotions (McFarland & Miller, 1990; Miller & McFarland, 1987; Prentice & Miller, 1996), people may perceive their own emotions as relatively more intense to the degree that the relative availability of emotional information influences their perceptions of emotional intensity.

Although our hypothesis of an immediacy bias in social-emotional comparisons uniquely implies a temporal pattern of perceived differences in emotional reactions experienced by the self versus others, two additional processes have been proposed to explain why people perceive their own emotions as more intense than others' emotions. Those two processes are worth consideration in the context of the proposed immediacy bias. One is that people may hold intuitive beliefs that their own emotions are more intense than others' emotions, particularly self-conscious emotions (McFarland & Miller, 1990; Miller & McFarland, 1987; Sabini et al., 1999). Our analysis implies that people generally perceive their emotions, whether self-conscious or not, as more intense than others' emotions. More importantly, our analysis also implies that people's tendency to perceive their emotions as more intense than others' emotions should diminish over time. Intuitive theories about the intensity of emotions in the self versus others, in contrast, imply temporal stability in social emotional comparisons—those intuitions should not change systematically with the intensity of emotional experience. Indeed, we later report evidence that people intuitively believe that self-perceived emotions are more intense than social-perceived emotions, but not that the self/other discrepancy declines over time.

Another process that may contribute to the perception that people's own emotions are more intense than others' emotions is egocentric focalism. In this context, egocentric focalism refers to the tendency for self-perceptions of absolute emotional intensity to be weighed more heavily than social-perceptions of absolute emotional intensity in direct, explicit comparisons of emotional intensity in the self versus others (Chambers & Suls, 2006; Klar & Giladi, 1999; Kruger, 1999). In one study, for example, people judged themselves as disliking Osama Bin Laden, nightmares, and Kenny G comparatively more than their peers did because people weighed their self-perceptions of absolute dislike more heavily than they weighed their social perceptions of absolute dislike (Chambers & Suls, 2006, Experiment 2). Egocentric focalism in comparative judgments of emotional intensity concerns the relative weighting of self- and social-perceptions of absolute emotional intensity, not how people make judgments of absolute emotional intensity in the self and others. As Chambers and Suls (2006) explain, "focalism . . . should produce the intensity bias in direct comparisons without there necessarily being any differences between the absolute ratings for self (or friend) and the average person" (p. 619), and "both the egocentrism and focalism account . . . state that the emotion intensity bias results from a narrowing of attention to one of the two entities in the *direct comparison*, not necessarily from any systematic differences in how the absolute preferences for target and referent group are perceived" (p. 621). In contrast with egocentric focalism, then, the immediacy bias in social-emotional comparisons implies that people perceive their own emotions as more intense than others' emotions even when judging the absolute intensity of those emotions, and that these perceived differences diminish over time.

The current research tests the immediacy bias in social-emotional comparisons. We began testing these hypotheses a decade ago in studies of naturally occurring emotional events. We decided early in our investigation to study people's perceptions of their own and others' emotional reactions to "real world" emotional events. Although we appreciate the control and precision afforded by laboratory experiments that study emotional reactions to controlled events, we believe that studies of naturally occurring events offer at least three advantages: (a) they allow an examination of naturally occurring emotional events rather than artificially constructed emotional events in the laboratory, thereby increasing the stimuli generalizability; (b) measuring perceived emotional reactions outside the lab affords examination of social-emotional comparisons in contexts with more natural emotional display norms rather than in experimental settings that may heighten norms to constrain emotional displays; and (c) measuring reactions to real world emotional events allow for more naturally occurring and extended temporal dynamics in the experience and expression of emotion whereas laboratory studies often entail artificially short temporal windows.

### Studies 1a and 1b: Explicit Comparisons of Emotional Intensity

In Studies 1a and 1b, we examined whether people would exhibit an immediacy bias when making explicit social comparisons regarding their own and others' emotional reactions. We predicted that people would perceive their own emotions as comparatively more intense than others' emotions, and that this perception would diminish over time. We examined the immediacy bias over a relatively short time span of minutes (Study 1a) and over a relatively longer time span of days (Study 1b). We also examined the immediacy bias in social-emotional comparisons of people's recalled emotional reactions to an increasingly distant event (Study 1a) and people's current emotional reactions to increasingly distant events (Study 1b).

#### Study 1a: Fear on a Bridge

**Method.** Eighty visitors to Lynn Canyon in North Vancouver ( $M_{\text{age}} = 32.78$  years; 42 females) who had recently crossed a suspension bridge participated in exchange for a candy bar. Reputation and pilot testing confirmed that the 1 m wide, 60 m long bridge that hangs precipitously 76 m above a raging river arouses feelings of anxiety, fear, and general arousal (Dutton & Aron, 1974). Participants were asked to "consider how intense your feelings (e.g., fear, anxiety, and so on) were while crossing the bridge." They then were asked to rate the intensity of their feelings compared with the average person crossing the bridge ( $-4 = \text{much less intense}$ ,  $0 = \text{neither more nor less intense}$ ,  $+4 = \text{much more intense}$ ).

Participants made their social comparisons following various delays after crossing the bridge. Some ( $n = 40$ ) were approached immediately after crossing the bridge (coded as a 0 min delay). Others responded in a nearby parking lot and were asked to indicate which of four time categories described how many minutes had passed since they crossed the bridge: 1 to 15 minutes ( $n = 9$ ), 16 to 30 minutes ( $n = 5$ ), 31 to 59 minutes ( $n = 21$ ), or 60 minutes or more ( $n = 5$ ). For the purposes of data analysis, we

used the middle time for the first three categories and the lower boundary for the last category. This resulted in five temporal values: 0 min, 7.5 min, 23 min, 45 min, and 60 min.

**Results.** As predicted, participants perceived their emotional reactions as comparatively more intense than the emotional reactions of other people who crossed the bridge, compared with the scale midpoint of 0 ( $M = .63$ ,  $SD = 2.15$ ),  $t(79) = 2.60$ ,  $p < .025$ . Also as predicted, participants were less inclined, over time, to recall their emotional intensity while crossing the bridge as being more intense compared with other people's emotional intensity while crossing the bridge. There was a significant effect of time in a linear regression estimating participants' social-emotional comparisons from the time elapsed since they crossed the bridge,  $b = -.033$ ,  $SE = .01$ ,  $\beta = -.34$ ,  $t(78) = 3.21$ ,  $p = .002$ . By comparison to the scale midpoint of 0, participants perceived their emotions as more intense than others' emotions immediately after crossing the bridge ( $M = 1.03$ ,  $SD = 1.90$ ),  $t(39) = 3.41$ ,  $p = .002$ , but not following a delay after crossing the bridge ( $M = .23$ ,  $SD = 2.34$ ),  $t < 1$ .

#### Study 1b: Columbia Shuttle Tragedy

The next study offered a conceptual replication of the immediacy bias in social-emotional comparisons with three extensions: (a) the time delay was of days rather than minutes; (b) the comparisons concerned a more substantial event (a national tragedy) that, unlike the bridge crossing, participants were not exposed to by self-selection; and (c) the social comparisons concerned reports of current emotional reactions to very recent and then increasingly distant past events, rather than reports of recalled emotional reactions to past events, as in Study 1a. This last extension is particularly important. In Study 1a, participants recalled emotional reactions to a past event (crossing a bridge) so it is possible that the effect of time on social-emotional comparisons is attributable to a degradation of memory for emotion over time, rather than to a decay of emotional intensity over time. Study 1b thus provides a more stringent test of our hypothesis by examining whether people perceive their current emotional reactions to past events—reactions that people can perceive directly rather than recall, as in Study 1a—as comparatively less intense over time, as emotions presumably subside.

**Method.** Forty-five undergraduates at the University of Colorado Boulder (age and participant sex were not recorded) completed a questionnaire as part of an unrelated study. Participants considered the tragic explosion of space shuttle Columbia on February 1, 2003 spending "a few moments thinking about the tragedy—what happened, how it happened, how people were affected . . ." They then reported on a nonnumeric 7-point scale that we later transformed for data analysis how upset thinking about the tragedy made them compared with how upset it made other students who thought about the tragedy on the same day as participants themselves ( $-3 = \text{others' feelings are stronger than mine}$ ,  $0 = \text{others' feelings are equally as strong as mine}$ ,  $+3 = \text{my feelings are stronger than others' feelings}$ ). Participants completed the questionnaire between 2 and 16 days after the tragedy.

**Results.** As predicted, participants perceived their own emotional reactions as comparatively more intense than their peers' emotional reactions, by comparison to the scale midpoint of 0 ( $M = .51$ ,  $SD = .52$ ),  $t(44) = 6.78$ ,  $p < .0001$ . Also as predicted,

participants perceived their emotional reactions as less intense compared with others' emotions over time. There was a significant effect of time in a linear regression estimating participants' emotional comparisons,  $b = -.07$ ,  $SE = .03$ ,  $\beta = -.35$ ,  $t(44) = 2.41$ ,  $p = .020$ .

### Discussion of Studies 1a and 1b

The results of Studies 1a and 1b offer support for an immediacy bias in explicit social-emotional comparisons. Participants perceived their immediate emotions as comparatively more intense than others' emotions, and this tendency diminished over time. This temporal pattern emerged over both relatively short time spans (of minutes after crossing a scary bridge) and relatively long time spans (of days after a national tragedy). This temporal pattern also emerged for memories of increasingly distant emotional reactions (to crossing a scary bridge) and for current emotional reactions to increasingly distant emotional events (a national tragedy). These two observations—that the perceived self-other difference in emotional intensity dissipated relatively quickly and occurred for both recalled emotions and current emotions—implicate that these perceived self-other differences are moderated by the immediacy of emotional experience, and are not fully attributable to intuitive about emotional experience or to egocentric focalism.

### Studies 2a, 2b, and 2c: Absolute Evaluations of Emotional Intensity

We next sought to conceptually replicate the immediacy bias in social-emotional comparisons with judgments of absolute emotional intensity rather than with explicitly comparative judgments of one's own versus others' emotional intensity. The shift to absolute judgments is important for two reasons. First, the use of absolute judgments affords an examination of social projection of emotional intensity. A large body of research demonstrates the social projection of emotional intensity (McFarland & Miller, 1990; Pollmann & Finkenauer, 2009; Sabini et al., 1999; Van Boven & Loewenstein, 2003; Van Boven, Loewenstein, & Dunning, 2005). Our hypothesis of an immediacy bias implies a mean difference in perceived emotional intensity in the self and others. Together, then, the immediacy bias and research on social projection implies that people should perceive their own relatively immediate emotions are more intense than others' emotions, that this mean difference should diminish over time, and that people's self-perceived emotional intensity should be correlated with their social perceptions of emotional intensity.

Second, as discussed earlier, an immediacy bias in absolute judgments would cast doubt out the possibility that the immediacy bias is solely attributable to egocentric focalism, which most strongly implies that self-perceptions of emotional intensity are weighed more heavily than social perceptions in explicit comparative judgments (Chambers & Suls, 2006). Unlike the immediacy bias, focalism less strongly implies that people perceive their own emotions as more intense than others' emotions when making judgments of absolute emotional intensity.

We also examined whether people hold intuitive beliefs that mirror the immediacy bias in social-emotional comparisons. Specifically, we asked people to predict how other people would

respond in a study where they reported the intensity of their own emotional reactions and estimated the intensity of others' emotional reactions to a national tragedy, when measured after a relatively short and relatively long delay following the tragedy. Based on previous research suggesting intuitive theories that people's own emotions are more intense than others' emotions (McFarland & Miller, 1990; Miller & McFarland, 1987; Sabini et al., 1999), we predicted that people would expect respondents to perceive their own emotions as more intense than others' emotions. We did not, however, predict that people would expect this difference between self and others to decline over time. If people's intuitive beliefs about temporal changes in emotional intensity in themselves and others do not correspond with actual temporal changes in emotional intensity in themselves and others over time, it is unlikely that intuitive beliefs explain the immediacy bias in social-emotional comparisons.

### Study 2a: September 11 Terror Attacks

**Method.** In a within-persons design, 24 university undergraduates ( $M_{age} = 21.88$ ; 18 females, six males) at Simon Fraser University, Vancouver, British Columbia, Canada, completed a survey on September 18, 2001 and November 8, 2001, one week and then nearly two months after the September 11 terrorist attacks. On each date, participants completed a questionnaire in which they were asked, separately, to report how upset (1 = *not at all upset*, 9 = *extremely upset*) they felt when thinking about the terrorist attacks how upset their classmates felt, on average, when thinking about the terrorist attacks. Order of the self and other ratings was counterbalanced.

**Results.** A 2 (target: self, other)  $\times$  2 (time: immediate, delayed) repeated measures ANOVA yielded the predicted interaction,  $F(1, 23) = 9.70$ ,  $p = .005$  (see Table 1). One week after the terrorist attacks, participants perceived themselves as more upset by the attacks ( $M = 7.25$ ,  $SD = 1.68$ ) than their classmates ( $M = 6.67$ ,  $SD = 1.44$ ),  $t(23) = 2.60$ ,  $p = .016$ . In contrast, two months after the attacks, participants did not perceive themselves as sig-

Table 1  
*Perceived Intensity of Emotion Experienced by the Self and Others in Studies 2a, 2b, and Study 3*

Study, Timing, and Condition	Target			
	Self		Other people	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Study 2a: September 11 <sup>th</sup> Terror Attacks				
Immediate (September 18 <sup>th</sup> )	7.25 <sub>a</sub>	1.67	6.67 <sub>b</sub>	1.43
Delayed (November 8 <sup>th</sup> )	6.00 <sub>a</sub>	1.77	6.33 <sub>a</sub>	.46
Study 2b: Hurricane Katrina				
Immediate (3–4 days after)	6.84 <sub>a</sub>	1.22	5.81 <sub>b</sub>	1.42
Delayed (one month after)	6.39 <sub>a</sub>	1.71	6.11 <sub>a</sub>	1.61
Study 3a: Presidential Election 2004 (Kerry Supporters)				
Control	-3.27 <sub>a</sub>	.88	-2.91 <sub>b</sub>	1.07
Display norm reminder	-2.81 <sub>a</sub>	1.33	-3.09 <sub>b</sub>	.91

*Note.* Means with different subscripts within a row are significantly different,  $p < .05$ . Within each study, more extreme numbers represent more intense emotions.

nificantly more upset ( $M = 6.00$ ,  $SD = 1.77$ ) than their classmates ( $M = 6.33$ ,  $SD = 1.47$ ),  $t(23) = 1.28$ ,  $p = .213$ . Finally, participants' self-perceptions of emotional intensity were positively correlated with their perceptions of others' emotional intensity, both one week and two months after the terrorist attacks, both  $r_s = .65$ ,  $p < .001$ , consistent with the social projection of perceived emotional intensity. These results conceptually replicate the immediacy bias in social-emotional comparisons, simultaneous with the social projection of emotions, and in a fully within-persons design, with judgments of absolute rather than comparative emotional intensity.

### Study 2b: Hurricane Katrina

The next study conceptually replicated the immediacy bias with judgments of absolute emotional intensity. We measured participants' memories of previously experienced emotional reactions to an increasingly distant event (as in Study 1a) rather than perceptions of current emotional reactions to an increasingly distant event (as in Studies 1b and 2a).

**Method.** Seventy-three undergraduate students at the University of Colorado Boulder (age and gender were not recorded) participated in exchange for a pen. Participants completed the study approximately one week or approximately one month following Hurricane Katrina's landfall. After thinking about "your reactions to Hurricane Katrina's devastation," participants were asked to "think back to how you felt during the first 3 or 4 days after Hurricane Katrina struck" and to report how upset they felt (1 = *not upset at all*, 9 = *extremely upset*) and concerned they were about the citizens of New Orleans (1 = *not concerned at all*, 9 = *extremely concerned*). Participants were also asked to think about the feelings of other University of Colorado Boulder students during the first 3 or 4 days after Hurricane Katrina struck, and to estimate on scales with the same labels how upset and concerned the other students were. The order of ratings for self and other students was counterbalanced. Participants' reports of upset and concern were positively correlated so we averaged the two relevant judgments into indices of self-perceptions ( $r = .68$ ) and social-perceptions ( $r = .77$ ).

**Results.** A 2 (target: self, other)  $\times$  2 (time: immediate, delayed) mixed-model ANOVA with repeated measures on the first factor yielded the predicted interaction,  $F(1, 71) = 4.18$ ,  $p = .045$  (see Table 1). One week after Hurricane Katrina struck, respondents recalled themselves as having been significantly more upset ( $M = 6.84$ ,  $SD = 1.22$ ) than others ( $M = 5.81$ ,  $SD = 1.42$ ),  $t(26) = 3.31$ ,  $p = .003$ . One month after Hurricane Katrina struck, in contrast, participants did not recall themselves as having been significantly more upset ( $M = 6.39$ ,  $SD = 1.74$ ) than others ( $M = 6.11$ ,  $SD = 1.61$ ),  $t(45) = 1.29$ ,  $p = .20$ . Finally, participants' self-perceptions were positively correlated with their social-perceptions of emotional intensity, partial  $r = .53$ ,  $p < .0001$ , controlling for the time of judgment, consistent with social projection of emotional intensity. These results conceptually replicate the immediacy bias in social-emotional comparisons with absolute judgments.

### Study 2c: Intuitions About Hurricane Katrina

We next examined whether people hold intuitive beliefs that might account for the immediacy bias pattern demonstrated in our

other studies. People were asked, shortly after the fifth anniversary of Hurricane Katrina's landfall, to predict how participants responded in Study 2b, either one week or one month after Katrina's landfall. We assessed the existence of intuitive beliefs about social-emotional comparisons by measuring people's intuitions about others' responses, rather than about their own responses, to minimize the possibility that people would answer based on their personal memories of emotional reactions to Hurricane Katrina. Given previous research suggesting an intuitive belief that people perceive their own emotions are more intense than others emotions (McFarland & Miller, 1990; Miller & McFarland, 1987; Sabini et al., 1999), we predicted that people would expect self-perceived emotions to be higher than social-perceived emotions. But because participants in this study were not actually reporting their own immediate or recent emotions, we did not expect the predicted differences between self- and social-perceived emotions to change over time.

**Method.** One hundred and five university undergraduates at the University of Colorado Boulder ( $M_{\text{age}} = 19.10$  years, 70 females) read about a study that had been conducted either, depending on random assignment, "approximately one week after Hurricane Katrina struck the Gulf Coast" or "approximately one month after Hurricane Katrina struck the Gulf Coast." Participants were given the same description of Hurricane Katrina that had been provided to participants in Study 2b. Participants read that participants in that study had been asked to report how upset they felt (1 = *not upset at all*, 9 = *extremely upset*) and how concerned they were about the citizens of New Orleans (1 = *not concerned at all*, 9 = *extremely concerned*). Participants in this study were asked to predict the responses of those who had initially participated in Study 2a, which we averaged into an index of intuitions about self-perceptions of emotional intensity ( $r = .58$ ). Respondents also predicted how they thought participants in the initial study would perceive others' degree of being upset and concerned, which we averaged into an index of intuitions about social-perceptions of emotional intensity ( $r = .65$ ).

**Results.** A 2 (target: predicted self-perception, social perception)  $\times$  2 (time: immediate, delayed) mixed-model ANOVA with repeated measures on the first factor, analogous to the model in Study 2a, yielded only a main effect of target,  $F(1, 103) = 11.01$ ,  $p = .001$ . Respondents intuited, correctly, that participants would perceive their own emotions as more intense ( $M = 7.58$ ,  $SD = 1.12$ ) than other people's emotions ( $M = 7.24$ ,  $SD = 1.33$ ). There was no significant effect of time,  $F(1, 103) = 1.71$ ,  $p = .194$ , power = .254. Most importantly, the time  $\times$  target interaction,  $F(1, 103) = .86$ ,  $p = .356$ , power = .151, in contrast with the central results of Study 2b. Finally, participants' estimates of others' self-perceived and social-perceived emotions were positively correlated, partial  $r = .48$ ,  $p < .001$ , controlling for time condition. Thus, people intuitively believe that self-perceived emotions are more intense than other-perceived emotions, consistent with previous research. And they intuitively believe that self-perceived and social-perceived emotions are positively correlated, consistent with social projection of emotional intensity. But participants did not believe that the perceived difference between self and others would diminish over time, in contrast with the central findings of the immediacy bias in social-emotional comparisons.

### Discussion of Studies 2a, 2b, and 2c

The results of Studies 2a, 2b, and 2c conceptually replicate and clarify that nature of the immediacy bias in social-emotional comparisons. Studies 2a and 2b demonstrate the immediacy bias with judgments of the absolute intensity of emotional reactions. The studies also demonstrate that the immediacy bias occurs simultaneously with social projection of emotional intensity. People's self-perceptions of emotional reactions to two national tragedies were more intense than their social perceptions of emotional reactions, and this pattern diminished over time. People's self-perceptions of emotional intensity were also positively correlated with their social perceptions of emotional intensity, consistent with previous work on social projection.

The results of Study 2c indicate that people hold an intuitive belief that self-perceived emotions are more intense than social-perceived emotions, and that self- and social-perceived emotions are positively correlated. But people do not intuitively believe that perceived differences between self and others in emotional intensity diminish over time, as we have demonstrated. Thus, although it is plausible that intuitive theories about emotion explain people's perception that their emotions are more intense than others' emotions, intuitive theories are unlikely to explain the change over time in people's perceptions of their own and others' emotions.

### Studies 3a and 3b: Undermining Emotional Displays

Our proposition is that people exhibit an immediacy bias in social-emotional comparisons partly because they compare their internal emotional experience, which seems particularly intense when the emotional event is relatively close (Van Boven et al., 2009), with others' external emotional appearances. These experience-appearance comparisons contribute to an immediacy bias because people often rein in public displays such that external appearances understate the intensity of emotional experience (Kleck et al., 1976; Kraut, 1982; Lanzetta et al., 1976; Yarczower, Kilbride, & Hill, 1979). The contrast between one's own intense immediate emotional experience and others' restrained emotional appearance implies that one's immediate emotions are more intense than others' emotions.

This reasoning implies that people's tendency to perceive their own emotions as more intense than others' emotions would be diminished by reminding people that public displays may understate the intensity of others' emotional experiences. We tested this prediction in Studies 3a and 3b. In both studies, people made social-emotional comparisons regarding naturally occurring emotional events (a disappointing election in Study 3a, terrorist attacks in Study 3b), either having been reminded that public displays may understate emotional intensity or not. In Study 3a, the reminder was a statement embedded in the study's introduction implying that public displays might not accurately reflect emotional experience. In Study 3b, the reminder entailed questions about people's personal beliefs regarding the correspondence between public displays and emotional intensity. Notice that this procedure simply measures people's personal beliefs, and is unlikely to imply particular beliefs held by the researcher, which might engender experimental demand.

We had three predictions. First, in both studies, we predicted that the reminder would reduce people's tendency to judge their

immediate emotions as more intense than others' immediate emotions. Second, we predicted that Study 3b would reveal people's belief that public displays understate emotional intensity, which implies that others' emotions are more intense than their experiences convey. Finally, in Study 3b, we measured social-emotional comparisons, either before or after being reminded about public displays, immediately after the terror attacks or nearly two months after the terror attacks. We predicted that the public display reminder would influence social-emotional comparisons one week after the attacks, when the contrast between emotional experience and appearance was starker, more strongly than one month after the attacks, when the contrast between experience and appearance was less stark.

### Study 3a: Emotional Displays About an Upsetting Election

**Method.** Sixty-six people recruited in a public space on the University of Colorado at Boulder campus (35 females, one unreported) participated in exchange for a candy bar. Participants read that the study was about "your own feelings and your judgments of other people's feelings about the 2004 Presidential" election. All participants supported the election of John Kerry over George W. Bush, as indicated by their answer above the midpoint ( $M = 8.33$ ,  $SD = .98$ ) on a 9-point scale (1 = *I strongly wanted George W. Bush to win*, 5 = *I was indifferent*, 9 = *I strongly wanted John Kerry to win*).<sup>1</sup> The study was conducted between one and three days following the election, while participants' disappointment was still running high.

Participants reported how upset or pleased they were with the reelection of George W. Bush ( $-4 = \textit{very upset}$ ,  $0 = \textit{neutral}$ ,  $+4 = \textit{very pleased}$ ). They were also asked to estimate how upset or pleased other University of Colorado at Boulder students who wanted John Kerry to win were on a separate scale with the same labels. The order of ratings for the self and others was counter-balanced.

Before answering these two questions, participants randomly assigned to the display norm reminder condition read, "We are interested in whether other people hide their feelings, not showing the true intensity of their feelings in response to the 2004 Presidential Election." Participants in the control condition did not read the reminder. Participants in both conditions were instructed to "Please try your best to respond honestly and accurately," completed the questionnaire, were thanked, given their candy bar, and debriefed.

**Results.** As predicted, participants perceived their own emotions as more intense than the emotions of other John Kerry supporters, and this tendency was diminished among participants reminded that people might constrain their emotional displays (see Table 1). A 2 (target: self, other John Kerry supporters)  $\times$  2 (reminder condition: control, emotional display reminder) ANOVA, with repeated measures on the first factor and control-

<sup>1</sup> Five additional respondents indicated they were indifferent about the election's outcome, and 22 respondents supported the election of George W. Bush. Given the widespread support of John Kerry among University of Colorado at Boulder students and given that our key measures pertain to perceived emotions of those who supported John Kerry, we included only John Kerry supporters in our analyses.

ling for how much participants' wanted John Kerry to win, revealed the predicted interaction,  $F(1, 63) = 5.44, p = .023$ . In the control condition, participants perceived themselves as significantly more upset by George W. Bush's election ( $M = -3.27, SD = .88$ ) than other John Kerry supporters ( $M = -2.91, SD = 1.07$ ),  $F(1, 31) = 6.45, p = .016$ , controlling for how much participants wanted John Kerry to win.<sup>2</sup> In the emotional display reminder condition, in contrast, participants perceived themselves as significantly less upset by George W. Bush's election ( $M = -2.81, SD = 1.33$ ) than other John Kerry supporters ( $M = -3.09, SD = .91$ ),  $F(1, 31) = 26.81, p < .001$ . The (unexpected) reversal rather than a simple (expected) reduction of people's tendency to perceive their own emotions as more intense than others' emotions may be because people often overcorrect for judgmental biases brought to their attention (e.g., DeSteno, Petty, Wegener, & Rucker, 2000; Wegener & Petty, 1997). Finally, participants' perceptions of their own emotional reactions were positively correlated with their perceptions of other Kerry supporters' emotional reactions, partial  $r = .22, p = .09$ , controlling for condition.

### Study 3b: Emotional Displays About Norwegian Terrorist Attacks

We next sought to conceptually replicate, in a subtler fashion, the finding that reminding people that public displays may not accurately convey the intensity of others' emotional experiences reduces people's tendency to judge their own emotions as more intense than others' emotions. We further sought to test whether this reminder would have less effect on people's social-emotional comparisons following a delay after the target emotional event. Such a pattern, in addition to the subtler operationalization of the reminder in this study, would cast doubt on the possibility that the predicted results are attributable to demand effects given that such effects would apply equally during both immediate and delayed survey responses.

The study concerned the July 22, 2011 domestic terrorist attack in Norway. Participants were asked to report the intensity of their own reactions compared with the intensity of others' reactions to the attacks. Participants were also asked, separately, the degree to which their own and other people's public displays understated, perfectly matched, or overstated their true emotional intensity. Depending on random assignment, participants answered these questions either before or after reporting their comparative emotional reactions. Participants completed this study either one week or two months following the terrorist attacks. Our primary prediction was that, one week after the attacks, the tendency to judge one's own emotions as comparatively more intense than others' emotions would be diminished when participants were first reminded that public displays may not perfectly convey the intensity of private emotions. We also expected that the public display reminder would have a smaller effect two months after the attacks, after the intensity of participants' emotional reactions to the attacks had presumably subsided. Finally, we predicted that people would report a belief that both their own and others' public displays tend to understate the intensity of experienced emotions.

**Method.** Two hundred and 77 participants ( $M_{\text{age}} = 21.95$ ; 101 females, 152 males, 22 unreported), recruited through Mechanical Turk (Burmester, Kwang, & Gosling, 2011), completed an online survey in exchange for \$0.50. Some respondents ( $n =$

85) completed the survey exactly one week after the July 22<sup>nd</sup> attacks, on July 29, 2011; other respondents ( $n = 191$ ) completed the survey nearly two months after the attacks, on and September 18, and 19, 2011. Respondents (of the 256 who reported a home country) were primarily from the United States (35%) and India (45%), with a minority from Europe (8%) and elsewhere (12%).

Participants first read a summary of the attacks. Anders Behring Breivik, a 32-year-old Norwegian right-wing extremist, detonated a car bomb explosion in the executive government quarter of Oslo, Norway, which killed eight people and wounded several others. He then attacked a youth camp on the island of Utøya in Tyrifjorden, Buskerud, shooting people at the camp, killing 69 people.

To measure social-emotional comparisons participants were asked, "When thinking about the Norway bombing and shootings, how intensely do you feel the following emotions compared with how intensely other people feel each of the following emotions?" They answered this question separately for four emotions on a nonnumeric scale that we later transformed for data analysis ( $-3 = I$  feel much less intense than others;  $0 = I$  feel equally intense as others;  $+3 = I$  feel much more intense than others): *angry, distressed, sad, and upset*. We averaged the four ratings into an index of social-emotional comparison ( $\alpha = .85$ ). Positive numbers indicate that participants perceived themselves as feeling relatively more emotionally intense than others.

Participants were also asked two questions about their own and others' public display of emotions in the context of the Norway attacks. Depending on random assignment, participants answered these questions either immediately before or immediately after judging their comparative emotional intensity. Participants read, "In public, people do not always display the true intensity of their emotions. That is, people's public display of emotions do not always match the intensity of their private emotions. Regarding the Norway attacks, how much do your public displays of emotion understate, perfectly match, or exaggerate the intensity of your emotions?" ( $-3 = My$  public displays understate the intensity of my emotional reactions to the Norway attacks;  $0 = My$  public displays perfectly match the intensity of my emotional reactions to the Norway attacks;  $+3 = My$  public displays overstate the intensity of my emotional reactions to the Norway attacks). They answered a similar question about other people's emotional displays, with appropriate pronoun replacement.

**Results.** A 2 (appearance reminder: social-emotional comparisons first, beliefs about public appearances measured first)  $\times$  2 (time: one week, two months) ANOVA on participants' social-emotional comparisons yielded the predicted interaction,  $F(1, 272) = 5.48, p = .020$  (see Table 2). Neither main effect was significant, both  $F_s < 1$ . Among respondents surveyed one week after the Norway terror attacks, participants in the control condition judged their emotional reactions as comparatively more intense ( $M = .73, SD = 1.66$ ) than did participants who had just reported their beliefs about how much their own and others' public appearances' portrayal of emotional intensity ( $M = .18, SD = 1.22$ ),  $t(82) = 2.06, p = .042$ . Among respondents surveyed two months after the attacks, participants in the control condition did not judge their emotional reactions as comparatively different

<sup>2</sup> The means are adjusted for ratings of how much participants wanted John Kerry to win.

Table 2  
*Perceived Comparative Intensity of Emotion Experienced by the Self and Others in Response to the 22 July 2011 Terror Attacks Oslo, Norway, Contingent on Whether Social-Emotional Comparisons Were Made One Week or Nearly Two Months Following the attacks, and on Whether Respondents Were First Asked How Much Their Own and Others' Public Displays Correspond With Private Emotional Intensity*

Time since terror attacks	Public display reminder (question order) condition			
	Control: emotion first		Public appearance reminder	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
One week	.73 <sub>a</sub>	1.17	.18 <sub>b</sub>	1.22
Two months	.34 <sub>b</sub>	1.29	.56 <sub>b</sub>	1.21

Note. Means with different subscripts within a row are significantly different,  $p < .05$ .

( $M = .34$ ,  $SD = 1.28$ ) than did participants who had just reported their beliefs appearances of emotional intensity ( $M = .56$ ,  $SD = 1.22$ ),  $t(190) = -1.21$ , *ns*. The tendency to perceive one's immediate emotions as more intense than others' immediate emotions was thus reduced by answering questions reminding people that appearances may not accurately convey emotional intensity—but this reminder did not influence peoples' social-emotional comparisons two months after the attack.

Also as predicted, participants' reported beliefs that emotional intensity was understated both by their own public displays ( $M = -.75$ ,  $SD = 1.58$ ), one sample  $t(273) = 7.91$ ,  $p < .001$ , and other people's public displays ( $M = -.24$ ,  $SD = 1.77$ ), one sample  $t(274) = 2.63$ ,  $p = .009$ .<sup>3</sup> A 2 (target: self, other people)  $\times$  2 (appearance reminder: social-emotional comparisons first, beliefs about public appearances measured first)  $\times$  2 (time: one week, two months) ANOVA, with repeated measures on the first factor revealed a main effect of target,  $F(1, 270) = 12.77$ ,  $p < .001$ , reflecting that participants believed that their own public displays tended to understate the intensity of their emotional reactions more than other people's public displays. Stated differently, participants believed that others' emotional displays more accurately portray their emotional intensity than do participants' own displays. The effect of target did not significantly interact with appearance reminder,  $F(1, 270) = 2.38$ ,  $p = .124$ , time,  $F < 1$ , or the appearance reminder  $\times$  time interaction,  $F < 1$ . Importantly, the appearance reminder  $\times$  time interaction—the key interaction in participants' social-emotional comparisons—was not significant,  $F < 1$ . Participants' beliefs about emotional appearances thus did not follow the same pattern as their social-emotional comparisons, indicating that participants' beliefs did not change in conjunction with their social-emotional comparisons.

### Discussion of Studies 3a and 3b

The results of Studies 3a and 3b together indicate that reminders that public displays may understate the intensity of people's emotional experience reduces people's tendency to judge their immediate

emotions as more intense than others' immediate emotions. Study 3a additionally replicated the tendency for perceptions of others' emotional intensity to be correlated with perceptions of one's own emotional intensity, even as people perceive their own emotions as comparatively more intense. Study 3b provided direct evidence of people's belief that public displays tend to understate emotional intensity, which implies that others' emotional experiences are more intense than their appearances convey. Study 3b also provided evidence that being reminded that public displays may understate emotional intensity reduces people's tendency to perceive their own emotions as comparatively more intense only immediate and relatively recent emotions; such reminders do not influence social-emotional comparisons following a substantial delay. These findings together lend credence to the possibility that people exhibit an immediacy bias partly because they compare their internal emotional experiences with others' external emotional appearances.

These findings raise two questions. First, might the results be attributable to experimental demand? People might have judged their own and others' emotions as being equally intense as a means of confirming researchers' hypotheses. Although we cannot directly rule out such an interpretation of Study 3a, where the manipulation entailed a statement about the experimenter's purpose (to study whether people hide the intensity of their emotions), experimental demand does not seem a compelling explanation of Study 3b, where no mention was made of the experimenter's purpose. Participants in Study 3b were instead reminded that public displays may understate emotional intensity simply by reporting their own personal beliefs about public displays. Furthermore, in Study 3b, the reminder influenced people's social-emotional comparisons one week after the Norway terror attacks, but not two months after the attacks. Demand characteristics are unlikely to produce such an effect of time. Finally, because the procedure of Study 3b simply required participants to report their own beliefs about public emotional displays—personal beliefs that did not change as a function of being reported before or after judging their own and others' emotions—the concern is minimized that participants generated beliefs they might not otherwise have entertained.

Second, given people's belief, measured in Study 3b, that others' public displays understate their emotional intensity, why might not people account for this belief when making social-emotional comparisons? The answer, we suspect, rests largely with people's general tendency to make initial, rapid, and often automatic inferences based on others' external appearances— inferences that are only subsequently, more slowly, and more effortfully corrected to accommodate knowledge and beliefs that are less immediately accessible (Gilbert, 1998; Gilbert & Malone, 1995; Ross, 1977). People often form stereotypic impressions of others based on visually salient information about sex or ethnicity, and only correct those inferences given sufficient time, motivation, and availability of nonstereotypic information (Fiske & Neuberg, 1990; Gilbert, 1989; Gilbert, 2002; Higgins, 1996; Kunda & Thagard, 1996; Read & Miller, 1998; Smith, 1996; Smith & Decoster, 2000; Trope & Gaunt, 2000). Similarly, people may initially infer

<sup>3</sup> Degrees of freedom differ across tests due to missing data.

that others' muted public displays reflect muted emotional experience unless reminded of the inaccuracy of public displays.

### General Discussion

The results of seven studies examining reactions to naturally occurring, "real world" emotional events demonstrate a novel pattern in the social perception of emotions: People perceive their own relatively immediate emotions as more intense than others' relatively immediate emotions, and this perceived self-other difference diminishes over time. This immediacy bias in social-emotional comparisons emerged for six naturally occurring types of emotional events, including crossing a scary bridge (Study 1a), a national tragedy (Study 1b), two different terrorist attacks (Studies 2a and 3b), a natural disaster (Study 2b), and a presidential election (Study 3a). This immediacy bias emerged both when people judged their immediate and their remembered emotional reactions (Studies 1a and 2b), and when people judged their current emotional reactions to immediate and previous events (Studies 1b and 2a). There was no evidence that people hold intuitive beliefs about this pattern of an immediacy bias in social-emotional comparisons (Study 2c), although they did intuitively expect self-perceptions of emotional intensity to be more intense than social-perceptions of emotional intensity.

Our explanation of the immediacy bias in social-emotional comparisons is, partly, derived from two other tendencies in emotion perception: First, that people tend to compare their (relatively intense) internal emotional experience with others' (relatively mundane) external emotional appearances (Miller & McFarland, 1987); second, that people perceive their relatively immediate emotions as more intense than their past emotions, and this tendency diminishes over time as immediate emotions subside (Van Boven et al., 2009). That is, just as immediately experienced and very recent emotions seem more intense than one's own relatively distant emotions, immediately experienced and recent emotions may seem more intense than others' emotions.

In Studies 3a and 3b, we examined whether the immediacy bias in social-emotional comparisons might be moderated by people's awareness that others' emotional appearances may understate intensity of their emotional experiences. In both studies, reminding people of the possibility that people may not display the true intensity of their emotions reduced the immediacy bias in social-emotional comparisons (Studies 3a and 3b). The reminder was either a direct statement in the study materials that the study was about whether people's appearances convey the true intensity of their emotions (Study 3a), or simply asking people to report their belief about how much their own and others' appearances understate, overstate, or perfectly correspond with the intensity of private emotional experience (Study 3b). Both reminders reduced people's perception that their own emotions were more intense than others' emotions. Also, the reminder only influenced social-emotional comparisons when people judged emotional reactions to very recent events (terrorist attacks from one week ago) not when they judged emotional reactions to more distant events (terrorist attacks from two months ago). This latter result, along with the relatively subtle nature of the reminder in asking people to report their beliefs, minimizes the possibility that the results of these studies are fully attributable to experimental demand.

Our results also minimize, across studies, several alternative interpretations. The fact that the immediacy bias emerged both when people made explicit comparisons of the intensity of their own emotions compared with others' emotions (Studies 1a, 1b, and 3b) and when people judged the absolute intensity of emotions experienced by themselves and others (Studies 2a, 2b, and 3). The occurrence of an immediacy bias in absolute judgments casts doubt that the immediacy bias is entirely explained by egocentric focalism (Chambers & Suls, 2006). Nor does egocentric focalism explain the transient nature of people's perception that their emotional reactions are more intense than others' emotional reactions. The transient nature of the immediacy bias in social-emotional comparisons also casts doubt on the possibility that the perceived differences between the self and others are completely explained by intuitive beliefs (McFarland & Miller, 1990; Miller & McFarland, 1987; Sabini et al., 1999), self-enhancement motives (Dunning, 1999; Kunda, 1990) or desires to be unique (Goethals, Messick, & Allison, 1991; Goethals, 1986; Snyder & Fromkin, 1977), none of which implies nor explains temporal changes in perceived differences between self and others. Finally, although there is evidence that people hold intuitive beliefs that self-perceived emotions are more intense than perceptions of others' emotions, we found no evidence that people hold intuitive beliefs that these differences between self perceptions and social perceptions of emotions change over time, in contrast with our other studies (Study 2c).

One question for future research is whether the same immediacy bias in social-emotional comparisons would emerge when people perceived the emotional reactions of another specific person, rather than a group of people. Because people can sometimes empathize more with the emotions of a single, specific person than with a group of people (Hsee & Weber, 1997; Small & Loewenstein, 2003), people may be less inclined to perceive their immediate emotions are more intense than another specific person's immediate emotions. The immediacy bias in social-emotional comparisons may therefore be diminished when making comparing one's own emotional reactions to another specific individuals' emotional reactions than to a group of individuals' emotional reactions. Future research might profitably investigate this possibility.

Future research might also examine the immediacy bias for positive emotions. Our theorizing would suggest that similar differences in perceptions of emotional intensity would emerge for both negative emotions, as examined here, and positive emotions. It is possible, however, that because negative emotional states are often more compelling than comparable positive emotions (e.g., Baumeister, Bratslavsky, Finkenauer, & Vohs, 2001), the immediacy bias may be more pronounced for negative than positive emotions.

Finally, future research might examine the potentially transient nature of psychological phenomena that have been attributed to people's perception that their own emotional reactions are more intense than others' emotional reactions. For example, people's reluctance to intervene in emergency situations is partly explained by people's attributing their reluctance to intervene to more intense fear of embarrassment than is experienced by others, whose reluctance to intervene is attributed to their appraisal of a non-emergency situation (Latané & Darley, 1970; Miller & McFarland, 1987). Our results imply transience to this pattern. After people's immediate emotions have declined over time, they may no longer

judge that their fear of embarrassment was stronger than others' fear of embarrassment, and may come to realize, retrospectively, that others' nonintervention was attributable to the same factors underlying their own inaction.

The potential transience of pluralistic ignorance represents how the immediacy bias represents a temporal "kink" in perceived emotional uniqueness. Such uniqueness is often disadvantageous, leading people to think, for example, that their immediate social anxieties, self-doubts, and other fears and phobias are particularly strong debilitating. Our findings thus offer cause for optimism: Perceptions of emotional uniqueness are fleeting.

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