


# Misery Has More Company Than People Think: Underestimating the Prevalence of Others' Negative Emotions

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## Abstract

Four studies document underestimations of the prevalence of others' negative emotions and suggest causes and correlates of these erroneous perceptions. In Study 1a, participants reported that their negative emotions were more private or hidden than were their positive emotions; in Study 1b, participants underestimated the peer prevalence of common negative, but not positive, experiences described in Study 1a. In Study 2, people underestimated negative emotions and overestimated positive emotions even for well-known peers, and this effect was partially mediated by the degree to which those peers reported suppression of negative (vs. positive) emotions. Study 3 showed that lower estimations of the prevalence of negative emotional experiences predicted greater loneliness and rumination and lower life satisfaction and that higher estimations for positive emotional experiences predicted lower life satisfaction. Taken together, these studies suggest that people may think they are more alone in their emotional difficulties than they really are.

## Keywords

emotion, emotion regulation, pluralistic ignorance, social comparison, well-being

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If we only wanted to be happy it would be easy; but we want to be happier than other people, which is almost always difficult, since we think them happier than they are.

Charles de Montesquieu, *Pensées* (1670/1991, p. 377)

We see those who go to the market to buy food, who eat in the daytime and sleep at night, who prattle away, merry... But we neither hear nor see those who suffer, and the terrible things in life are played out behind the scenes.

Anton Chekhov, "Gooseberries" (1898/1979, p. 192)

Imagine a happy hour featuring coworkers Juan, Lisa, and Jen. Juan has been struggling recently with poor feedback from his boss, Lisa has been dealing with marital and financial difficulties, and Jen has been suffering restless nights because of loneliness. Yet surrounded now by pleasant company and good refreshments, they all wear smiles on their faces. When asked by the others how they're doing, each of them, judging it inappropriate to express unhappiness at a happy hour, says that things are fine, and each is left thinking that only he or

she is weathering rough times. Thus, whereas Juan, Lisa, and Jen attribute their own publicly carefree demeanors to impression-management concerns and situational influences, they assume that their colleagues' similar behavior reflects true contentment in their personal lives.

Might the experiences at this hypothetical happy hour be representative of more general errors in people's perceptions of others' emotional lives? In this article we present four studies suggesting that people are systematically biased in their judgments of peers' inner lives, underestimating the prevalence of negative emotional experiences. We argue that these errors are driven by the relative covertness of negative emotional experiences and that such errors are associated with loneliness, rumination, and reduced life satisfaction.

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## Two Sources of Error in Perceiving Others' Emotional Lives

### *The Unobservability of Others' Solitary Experiences*

Our hypothesis that people think others' emotional lives are better than they actually are is based on two facts. First, whereas people can observe their own experiences and emotions across all settings, including solitary ones, people can directly observe *others'* experiences and emotions only in social settings. This limitation in the scope of peer observation may lead to biased sampling of others' emotional lives. Experience-sampling research indicates that people experience more positive emotion and less negative emotion in social contexts compared to solitary ones (Diener, Larsen, & Emmons, 1984; Larson, Csikszentmihalyi, & Graef, 1982). For example, participants in one study were more happy and cheerful and less sad, irritable, bored, and lonely when with other people than when alone (Larson et al., 1982). Thus, the fact that people can observe other individuals only in social settings, where people tend to feel good, may bias perceptions of others' emotional experiences. Failing to see others in solitary contexts, where they are more likely to feel bad, and which constitute more than half of people's daily lives (at least in the United States; Oishi, Diener, Scollon, & Biswas-Diener, 2004), people may underestimate the peer prevalence of negative emotional experiences.

### *The Preferential Suppression of Negative Emotion*

In addition to genuinely experiencing more positive emotion and less negative emotion in social settings, people may also tend in such situations to preferentially suppress the expression of negative emotion compared to positive. Display rules (Ekman & Friesen, 1969) dictate that it is inappropriate in many social situations to show negative emotion, and indeed a survey of emotion regulation in everyday life found that emotion regulation episodes involved negative emotions 9 times as often as positive emotions and that almost all of these episodes occurred in social settings and were attempts at suppression rather than up-regulation (Gross, Richards, & John, 2006). In other words, the vast majority of people's attempts at regulating their emotions involve the suppression of negative emotion in public. About half of the regulation episodes in Gross et al.'s (2006) sample focused on modifying the experience of the emotion itself, whereas the other half focused on suppressing only the expression of the emotion, both verbal and nonverbal (see Gross, 2001, for more on this distinction).<sup>1</sup> Down-regulating the experience of negative emotion may contribute to the aforementioned association between social settings and positive (experienced) emotion found in experience-sampling studies, whereas the

suppression of negative emotional expression may mean that even when people are feeling bad in public settings, observers may be oblivious to this fact.

Pressures to suppress negative emotion may not only skew people's direct observations of others' emotions in social settings but also distort people's *indirect* observations of others' private emotional lives. Absent the ability to directly observe others' solitary emotional experiences, people may solicit such information in conversation, inquiring about one another's general well-being, but prescriptions against the admission of negative emotion—and favoring the expression of positive emotion—may thwart this avenue of information too. As one university student explained in a newspaper editorial,

I can count on one hand how many times I've told anyone how sad I can get, partially because I'm never sad when I'm talking to someone—a friend, a stranger, a waitress, anyone who can validate my existence—and partially because I'm embarrassed by my own sadness. (Franich, 2007)

A corollary of this idea is that the greater number of close confidants a person has—people with whom negative emotional experiences can be shared, bidirectionally, without embarrassment—the less severe should be that person's errors in estimating the prevalence of emotional experiences. With a quarter of Americans reporting no confidants in their lives (McPherson, Brashears, & Smith-Lovin, 2006), there may be many individuals who have little knowledge of others' private negative emotional experiences.

## Emotional Pluralistic Ignorance

Although most research on pluralistic ignorance has focused on misperceptions of others' private attitudes, beliefs, or behaviors (e.g., Prentice & Miller, 1993) rather than their emotions, the process we are proposing shares much with this research tradition. In a typical case of pluralistic ignorance, people misperceive others' private attitudes because of the purposeful public misrepresentation of those attitudes, and in turn these misperceptions cause people to continue to publicly misrepresent their own private attitudes to align with what they (mistakenly) believe to be the norm (Miller & McFarland, 1987). With people reluctant to express their genuine attitudes lest they be embarrassed or rejected by peers, people end up feeling more alone in their private attitudes than is warranted. For example, in one classic study, community members believed that their fellow citizens uniformly supported the local church's opposition to card playing and smoking since such support was commonly espoused in public. In private, the same individuals admitted that they actually did not support the church's moral proscriptions, but they dared not express these views in public (Schanck, 1932). The irony,

of course, is that their self-perceived heretical view was actually the (secret) normative opinion of their community.

The phenomenon we propose could be described as “emotional pluralistic ignorance”: People perceive others’ apparent well-being in public settings and infer from this that other people are genuinely content with their lives, both in the moment and in private settings. But because people tend to experience more negative emotions in private than in public, and because people preferentially suppress negative emotions in public settings, this perception of others’ stable well-being is illusory. Nonetheless, it encourages people to hide their own negative emotional experiences from peers, and a vicious circle of pluralistic ignorance ensues. Just as attitudinal pluralistic ignorance can make individuals feel alienated from their peers (Prentice & Miller, 1993), we propose that this emotional pluralistic ignorance can reduce people’s well-being.

### Effects on Well-Being

Most people prioritize the pursuit of happiness as a paramount life goal (Sheldon & Houser-Marko, 2001), but the objective life features that people think affect their happiness, such as wealth, education, and marital status, account for only about 10% of the variance in people’s actual happiness levels (Lyubomirsky, Sheldon, & Schkade, 2005). Some researchers have proposed that a sizeable chunk of the remaining variation in human happiness may be explained by individual differences in cognitive processes, particularly those that relate to the perception of self and others (e.g., Lyubomirsky, 2001). One such cognitive factor that may affect everyday well-being, we propose, is people’s perceptions of the norms of emotional experience, both negative and positive.

Social comparisons to one’s peer group influence happiness (Olson & Evans, 1999; Wheeler & Miyake, 1992) and have even been theorized to play a role in the etiology and maintenance of depression (Weary, Elbin, & Hill, 1987). Upward social comparisons generally make people feel worse (Olson & Evans, 1999; Wheeler & Miyake, 1992), especially people who are already dysphoric (Lyubomirsky & Ross, 1997, Study 1) or who are especially concerned about the domain of interest (Giordano, Wood, & Michela, 2000), whereas downward comparisons generally have the opposite effect. We propose that the comparison of emotional experiences, in particular, may affect people’s well-being. Indeed, some research suggests that downward emotional comparisons can improve people’s well-being: In one study, reading about a peer who was experiencing very negative affect improved the moods of depressed undergraduates (Gibbons, 1986), whereas in another study, depressed participants preferred conversations with other individuals who had been told to act depressed themselves, compared to conversations with individuals who had been told to act happy (Coates & Peterson, 1982). These studies, taken in combination with the broader social comparison literature,

suggest that if, as we hypothesize, people misperceive others as having more pleasant emotional lives than they actually do, this may have serious consequences for people’s well-being. Specifically, we hypothesize that lower estimations of the peer prevalence of negative emotional experiences, as well as higher estimations of the peer prevalence of positive emotional experiences, may make people feel more lonely, ruminative, and depressed and less happy and satisfied with their own lives.

### The Present Research

Based on the foregoing analyses, we formulated the following hypotheses about people’s perceptions of others’ emotional lives:

*Hypothesis 1 (H1):* Negative emotional experiences are more difficult for outsiders to observe than are positive emotional experiences: Negative emotions occur more frequently in solitary settings (H1a), are preferentially suppressed in public settings (H1b), and are less likely to be talked about after the fact (H1c).

*Hypothesis 2 (H2):* People underestimate the prevalence and extent of others’ negative emotional experiences (H2a), whereas they do not make these errors for positive emotional experiences (H2b).

*Hypothesis 3 (H3):* People’s misperceptions of the extent of negative (vs. positive) emotions in their peers’ lives are mediated by the degree to which their peers preferentially suppress their negative (vs. positive) emotions.<sup>2</sup>

*Hypothesis 4 (H4):* More severe errors of the kind posited in H2 are associated with lower standing on well-being indicators—for example, greater loneliness.

We tested these hypotheses in four studies. Study 1a asked participants to recall negative and positive emotional experiences and to report for each whether they were alone or with others (testing H1a), whether they tried to hide their emotions (testing H1b), and whether they subsequently discussed the experience with others (testing H1c). Study 1b used the modal emotional experiences (negative and positive) volunteered in Study 1a and asked participants whether they had gone through each in the past 2 weeks and to estimate its prevalence among their peers (testing H2a and H2b). To test the robustness of the estimation errors documented in Study 1b, and as an initial investigation into the origins of these errors, Study 2 examined a preexisting data set of participants and their peers. We tested whether peers’ errors in perceiving the extent of negative versus positive emotions in participants’ lives were mediated by the degree to which participants preferentially suppressed their negative (vs. positive) emotions (testing H3). Study 3 used the same experiences as Study 1b and tested the relationship between the social misperceptions

documented in this article and common indicators of well-being (testing H4).

Across the four studies, we examined perceptions of peers' emotional lives from different angles by varying the specific target of participants' estimations. In Study 1b, participants estimated the peer prevalence of emotional experiences that followed from emotionally valenced events (e.g., receiving a high grade), whereas in Study 2 they estimated the overall extent of individual peers' emotions (e.g., happiness), without reference to any events that might be associated with them, and in Study 3, participants estimated the peer prevalence of emotionally valenced events, without reference to any particular responses that might be associated with them. By varying the targets of estimation in this way, we ensured that any consistent pattern of results we obtained would not be the result of methodological idiosyncrasies, and we broadened the range of questions on which our investigations might shed light (e.g., Do people misestimate the population prevalence of emotion-evoking events, the extent of emotions in individual peers' lives, both of these, or neither?). The literature we have reviewed suggests that people may underestimate both the population prevalence of negatively valenced emotion-evoking events (because these events tend to occur privately) and the overall extent of negative emotions that peers feel (because of the suppression of negative emotion as well as the covertness of negative events).

### Pilot Study

As a preliminary test of our central hypothesis that people underestimate the peer prevalence of negative emotional experiences (H2a), we asked introductory psychology students (122 at a West Coast university and 225 at an East Coast university) to estimate the percentage of their classmates who had had each of four common negative emotional experiences at least once in the past month and to report whether they themselves had had each of the experiences during the same period. For all four experiences (feeling really depressed for a day, feeling very lonely on a weekend night, being sad enough about something in their lives that they cried, and feeling overwhelmed by schoolwork or extracurricular activities), students at both universities underestimated peer prevalence, one-sample *t* tests, all *ps* < .001. At one university, students estimated that 52% of their peers had felt depressed, 38% had felt lonely, 43% had cried, and 78% had felt overwhelmed by work, whereas respectively 78%, 56%, 66%, and 94% of students reported having actually had each of these four experiences; similarly, at the other university, the figures for estimated and actual (reported) prevalence were 54% and 68% for feeling depressed, 42% and 62% for feeling lonely, 41% and 59% for crying, and 82% and 92% for feeling overwhelmed. Moreover, a large majority of participants at each university underestimated the prevalence of each experience, all *ps* < .06. As would be predicted by social projection

(Allport, 1924) and false consensus (Ross, Greene, & House, 1977) research, participants' own experiences were correlated with their estimations of others' experiences (all *ps* < .07), but even participants who reported having had the negative emotional experiences underestimated their occurrence for others in all four cases at one university and three out of four cases at the other university (all *ps* < .01).<sup>3</sup>

Despite providing encouraging initial support for our central hypothesis, this pilot study's design was limited in two important ways. First, the emotional experiences were generated by the experimenters and therefore may not have been representative of the negative emotional experiences common among the participant population. Second, this study did not examine prevalence estimates for positive emotional experiences; estimation errors might obtain in the same direction for both negative and positive experiences. To overcome these limitations, in Study 1a we asked participants to describe their own negative and positive emotional experiences, and then we used those experiences in Study 1b to investigate prevalence estimation errors.

### Study 1a: Are Negative Emotional Experiences More Covert Than Positive Emotional Experiences?

Our first goal in Study 1a was to test the hypothesis (H1) that negative emotional experiences are more covert, or difficult for outsiders to observe, than are positive emotional experiences. Specifically, we predicted that when asked to describe recent negative and positive emotional experiences, individuals would report that a greater proportion of the negative emotional experiences occurred in private (H1a), involved effortful hiding of emotion from any observers (H1b), and were not shared with anyone else afterward (H1c). Our second goal in Study 1a was to create an inventory of the most common negative and positive emotional experiences among our participant population for use as stimuli in Study 1b.

#### Method

**Participants.** A total of 63 first-year students (31 female) at a medium-sized West Coast university volunteered to participate.

**Procedure.** Participants completed two survey pages in one of two counterbalanced orders. On one page, they were given the following instructions:

Please consider, for a moment, the last 2 weeks of your life. When have you felt good? When have you felt bad?

Below, in each of the 3 boxes provided, please describe a time you have experienced **negative emotions** during

**Table 1.** The Most Common Negative and Positive Emotional Experiences and Their Covertness (Study 1a)

Experience	Proportion in solitary setting (zero in response to [A])	Proportion with emotion effortfully hidden (yes in response to [B])	Proportion not later shared verbally (zero in response to [C])
<b>Negative experiences</b>			
Had fight/argument	.06	.33	.33
Thought about distant friends/family	.45	.27	.55
Thought about enormous workload	.33	.33	.38
Was rejected by boy/girl	.22	.56	.33
Received low grade	.19	.56	.42
Thought about bad personal health habits	.75	.13	.38
<b>Positive experiences</b>			
Received high grade	.24	.29	.24
Attended fun party	.13	.13	.25
Participated in athletics	.23	.08	.46
Went out with friends	0	.11	.22
Talked to distant friends/family	.47	.05	.68
Had great meal	0	.07	.55

this period, and, after each description, please specify (A) the number of other people who could directly observe you while you were experiencing the emotion, (B) whether you tried to hide the emotion from others who could observe you (*yes* or *no*), and (C) the number of people, not present during the emotional experience itself, with whom you spoke about it afterwards.

On the other page, participants were given the same instructions but for positive emotions.

## Results

Participants described 187 negative and 187 positive emotional experiences. The average covertness of the negative versus the positive emotional experiences was determined by analyzing participants' responses to the questions (A, B, and C) that followed each of their descriptions of an emotional experience. Because of the nonnormal distributions of responses to Questions (A) and (C), responses to these questions were dichotomized to "0" and "1 or more." Analyses revealed that negative emotional experiences were reported as more covert than positive emotional experiences. Although 29% of the negative emotional experiences were reported as occurring in a private setting (i.e., zero direct observers present), only 15% of the positive emotional experiences were,  $\chi^2(1) = 10.55, p = .001$ . Although 40% of negative emotions were reported as being effortfully hidden from observers, only 13% of positive emotions were,  $\chi^2(1) = 33.71, p < .001$ . And although 36% of negative emotional experiences were reported as not being shared (verbally) with anyone else after their occurrence, only 26% of positive emotional experiences were,  $\chi^2(1) = 3.93, p < .05$ .

To determine the most common negative and positive emotional experiences among the participant population (for use in Study 1b), two coders examined participants' responses and, after independent initial categorization of experiences, decided mutually on the six most common types of negative experience and the six most common types of positive experience (see Table 1 for these experiences and their associated covertness scores). They then independently coded all of the experiences as belonging to one of these 12 experience categories or a category of "other." Interrater agreement was excellent ( $\kappa = .93$ ).<sup>4</sup>

## Discussion

Participants reported that their negative emotional experiences were more likely than their positive experiences to occur in private settings (H1a) and were more likely to involve hiding emotions from any observers present (H1b). These results are consistent with experience-sampling studies finding that people experience more negative emotion and less positive emotion in solitary settings compared to public settings (e.g., Diener et al., 1984; Larson et al., 1982) and with emotion regulation studies finding that people suppress negative emotion more often than positive emotion (e.g., Gross et al., 2006). Going beyond these past studies, in Study 1a we also found that people reported being less likely to talk later to other people about their negative emotional experiences, compared to their positive experiences (H1c). Thus, not only is there a direct perceptual block to observing others' negative emotional experiences, but there is also a block to *indirect* access to others' negative experiences since people are less likely to later discuss them.

These results support our hypothesis that negative emotional experiences are more difficult for outsiders to observe

than are positive emotional experiences (H1) and provide a possible explanation for the underestimation errors we observed for negative experiences in our pilot study. If negative emotional experiences occur fairly frequently in solitary settings (29% of the time in our sample) and often involve the suppression of emotions that might alert any observers to their occurrence (40%), then it makes sense that people would underestimate the peer prevalence of such experiences. On the other hand, given the low frequency with which positive emotional experiences occur in private (15% of the time in this sample) and involve emotional suppression (13%), we would predict that people would not underestimate the prevalence of positive emotional experiences among their peers (H2b). We test these predictions in Study 1b, using as stimuli the most common negative and positive emotional experiences described by participants in Study 1a.

### Study 1b: Do People Underestimate the Peer Prevalence of Negative (But Not Positive) Emotional Experiences?

In addition to demonstrating that negative emotional experiences are more likely to be hidden from observers than are positive emotional experiences, Study 1a generated an inventory of common negative and positive emotional experiences among the participant population (i.e., first-year college students). By using these representative experiences as stimuli, Study 1b was designed to test more rigorously than our pilot study the hypothesis that people underestimate the peer prevalence of negative emotional experiences (H2a) and to test whether such errors also extend to positive experiences (H2b). Participants in Study 1b estimated the proportion of their peers who had recently had each of several emotional experiences and indicated whether they themselves had recently had each experience. We predicted, based on the relatively public nature of positive emotional experiences compared to negative emotional experiences documented in Study 1a, that participants would not underestimate the prevalence of positive experiences, whereas they would show underestimation errors for the negative experiences.

#### Method

**Participants.** A total of 80 first-year students (45 female) at a medium-sized West Coast university volunteered to participate.

**Procedure.** Participants completed two survey pages presented in one of two counterbalanced orders. On one page, they were asked to estimate the percentage of fellow first-year students taking the survey who had had, sometime in the past 2 weeks, each of the 12 most common emotional experiences (6 negative, 6 positive) generated by participants in Study 1a. For example, participants estimated the proportion of their

peers who had recently “had a distressing fight or argument with a friend or partner,” “felt sad because they missed people outside the university such as parents or friends,” “received a high grade and felt really good about it,” and “felt happy to see or talk to friends or family they rarely get to see or talk to.” On the other page, participants indicated whether they themselves had had each of the 12 experiences sometime in the past 2 weeks. To increase participants’ motivation to estimate accurately, two \$50 prizes were awarded to the participants who made the smallest peer-prevalence estimation errors, on average, across the emotional experiences.

#### Results

Table 2 shows the reported prevalence of each emotional experience among the participants as well as their average estimates of peer prevalence. For all six negative emotional experiences, participants underestimated prevalence, one-sample *t* tests, all  $ps < .001$ . In contrast, participants significantly overestimated the prevalence of three of the positive experiences and underestimated the prevalence of only one of them, one-sample *t* tests,  $ps < .001$ , whereas estimates for two of the positive experiences did not differ significantly from reported prevalence. The average estimation error for the negative experiences was an underestimate of 17.2 percentage points ( $SD = 7.7$ ), which differed significantly from the average estimation error for the positive emotional experiences, an overestimate of 5.6 percentage points ( $SD = 11.7$ ),  $t(10) = 3.99$ ,  $p < .01$ ,  $d = 2.52$ . Overall, estimation errors for the negative experiences differed significantly from zero, one-sample  $t(5) = 5.47$ ,  $p < .01$ , whereas estimation errors for the positive experiences did not differ significantly from zero, one-sample  $t(5) = 1.18$ , *ns*.

#### Discussion

In Study 1b, we observed the same underestimation of negative emotional experiences seen in our pilot study (in support of H2a), even with the lure of a \$50 prize motivating participants to be as accurate as possible in predicting their peers’ reports and even with a representative sample of emotional experiences generated by participants from the same population as in Study 1a. Going beyond our pilot study, Study 1b showed that participants did not make underestimation errors for positive emotional experiences (in support of H2b); in fact, participants thought that their peers were going out with friends and attending parties more than they actually were. We believe that this difference in estimation accuracy for negative versus positive emotional experiences—a very large effect by conventional standards (Cohen, 1988)—was the result of the relative covertness of negative emotional experiences documented in Study 1a. In Study 2, we test the mediational hypothesis that the suppression of negative emotion (compared to positive) contributes to its underestimation by outside observers.

**Table 2.** Estimation Errors for Negative and Positive Emotional Experiences (Study 1b)

Experience	Percentage of classmates who have had experience in past 2 weeks			Estimation error (estimated – reported)
	Estimated	SD	Reported	
Negative experiences				
Had fight/argument	29.5	18.6	42.5	–13.0***
Thought about distant friends/family	53.7	25.1	82.5	–28.8***
Thought about enormous workload	75.3	20.8	87.5	–12.2***
Was rejected by boy/girl	22.4	12.6	31.3	–8.9***
Received low grade	44.1	19.6	60.0	–15.9***
Thought about bad personal health habits	45.9	24.3	70.0	–24.1***
Positive experiences				
Received high grade	62.0	19.6	65.0	–3.0
Attended fun party	62.2	17.6	41.3	+20.9***
Participated in athletics	53.7	20.5	40.0	+13.7***
Went out with friends	57.6	20.3	45.0	+12.6***
Talked to distant friends/family	61.7	18.8	70.0	–8.3***
Had great meal	61.5	24.1	63.8	–2.3

\*\*\* $p < .001$ .

## Study 2: Is Suppression of Negative Emotion a Source of Error in Perceiving Peers' Emotional Lives?

In Study 1b, participants underestimated the peer prevalence of negative, but not positive, emotional experiences. In Study 2 we sought to test the hypothesis (H3) that the preferential suppression of negative emotion would mediate people's differential accuracy in perceiving others' negative versus positive emotional lives. To do so, and to test the robustness of our effect to variations in study methods, we analyzed a preexisting data set (collected for other purposes; see Srivastava, Tamir, McGonigal, John, & Gross, 2009) consisting of online diaries that student participants and their peers kept over the course of an academic term. We tested whether participants who showed the greatest preferential suppression of negative (vs. positive) emotions would have peers who showed the largest errors in estimating the extent of participants' negative (vs. positive) emotions.

By examining the misperception of others' emotional lives at the individual level—that is, by looking at estimation errors for specific individuals known well by their peer estimators—Study 2 also went beyond Study 1b, in which only group norms were estimated (i.e., the proportion of the population who had had a particular emotional experience). The design of Study 2 thus enabled us to test whether the types of misperceptions documented in Study 1b would exist even for individuals with whom people have regular contact.

### Method

**Participants.** As part of a study of the transition to college life, 214 first-year students (128 female) at a medium-sized West

Coast university completed Internet-based logs of their emotional lives and nominated close peers who then submitted ratings of their perceptions of the participants' emotional lives.

**Procedure.** Over the course of their first 10-week term of college, students rated, at the end of every week, the extent to which they felt 17 specific emotions (8 negative, 9 positive; see Table 3) during that week, using a 5-point Likert scale ranging from *not at all* to *extremely*.

At the end of the term, participants nominated up to three peers who knew them well; most were friends (63%), roommates (23%), or romantic partners (9%). Peers were then mailed paper questionnaires on which they privately rated the extent to which they thought the participant whom they knew felt each of the 17 specific emotions over the course of the term, using the same emotion items and the same 5-point scale ranging from *not at all* to *extremely*.

In the middle of the term, participants also rated, for 7 consecutive days, the extent to which they “experienced (felt on the inside)” and “expressed (showed on the outside)” each of the 17 emotions during the most negative and the most positive event of the day.

### Results

**Peer estimates of participants' negative and positive emotions.** Weekly self-ratings and end-of-term peer-ratings were sufficiently complete for analysis for 140 participants. Peer-ratings were averaged across raters, yielding a single peer-rating for each participant. By comparing average peer-ratings to average self-ratings (across the 10 weeks of the term) for each participant on each of the 17 emotions, we determined peer errors in the perception of participants' emotional lives. As shown in Table 3, the difference between peer-ratings and

**Table 3.** Expression–Experience Discrepancies and Peer Estimation Errors for Negative and Positive Emotions (Study 2)

Emotion	Expression–experience discrepancy	SD	Peer estimation error (peer – self ratings)	SD
<b>Negative emotions</b>				
Anxious, nervous	–0.46***	0.52	–0.48**	0.98
Homesick, missing his/her pre-college life	–0.30***	0.44	–0.04	0.88
Put down, hurt, rejected by others	–0.26***	0.39	–0.20**	0.75
Angry, irritated, pissed off	–0.43***	0.47	–0.33**	1.00
Tired, fatigued	–0.47***	0.56	–0.59**	1.00
Jealous, envious	–0.34***	0.52	–0.43**	0.99
Lonely, isolated	–0.42***	0.46	–0.38**	0.97
Sad, depressed, down	–0.40***	0.47	–0.36**	0.87
<b>Positive emotions</b>				
Happy, pleased, contented	–0.15***	0.49	+0.11*	0.64
Amused, having fun	–0.06*	0.35	+0.17**	0.67
Affectionate, loving, caring/warm toward others	–0.15***	0.37	+0.11	0.76
Proud, a sense of accomplishment, successful	–0.35***	0.42	+0.32**	0.79
Self-confident, capable, worthwhile	–0.24***	0.44	+0.49**	0.49
Attracted to somebody (romantically or sexually)	–0.34***	0.50	–0.19*	1.07
Interested, intellectually engaged/stimulated	–0.12***	0.39	+0.20**	0.87
Cared about, loved, connected to others	–0.21***	0.36	+0.19**	0.85
Hopeful, optimistic	–0.25***	0.52	+0.27**	0.75

Note: Significance tests are one-sample *t* tests against a test value of zero.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

self-ratings was, on average, negative for all 8 of the negative emotions (i.e., close peers underestimated the extent to which participants felt these emotions), whereas this difference was positive for 8 of the 9 positive emotions (i.e., peers overestimated the extent to which participants felt these emotions). Estimation errors were significant in 15 out of 17 cases according to single-sample *t* tests. For the emotion “attracted to somebody (romantically or sexually),” the underestimation error for men was larger than the underestimation error for women,  $p < .05$ .

Average peer-perception errors for negative and positive emotions were calculated for each participant (i.e., the peer-perception errors for each of the 8 negative emotions were averaged, as were the errors for each of the 9 positive emotions, for each participant). A paired-samples *t* test revealed that the average error for negative emotions ( $M = -0.35$ ,  $SD = 0.59$ ) was significantly different from the average error for positive emotions ( $M = 0.19$ ,  $SD = 0.49$ ),  $t(139) = 8.07$ ,  $p < .001$ ,  $d = 1.00$ . Overall, estimation errors for negative emotions differed significantly from zero, one-sample  $t(139) = 7.03$ ,  $p < .001$ , as did estimation errors for positive emotions, one-sample  $t(139) = 4.45$ ,  $p < .001$ . In other words, peers, on average, underestimated the extent to which participants felt negative emotions, whereas they overestimated the extent to which participants felt positive emotions—even though these peers were in a position to observe the participants frequently and sometimes in close quarters.

Since self-ratings for the calculations above were averaged over the course of 10 weeks whereas peer-ratings were made only at the end of those 10 weeks, there could be concern that

our effects were driven by the temporal difference between self- and peer-ratings. For example, perhaps peers’ retrospective ratings were biased by recent memories and would accurately reflect the final week of participants’ self-ratings but not the aggregated 10 weeks. To test this idea, we compared peer-ratings to self-ratings for each of the individual 10 weeks. For every one of the 10 weeks, peers’ ratings of participants’ emotions were underestimates for negative emotions and overestimates for positive emotions. Paired-samples *t* tests comparing average errors for negative and positive emotions were significant for every week except Week 8 (during which many students had gone home for the Thanksgiving holiday), when the difference was marginal,  $p < .07$ . We therefore are confident that our effects were not the result of this alternative explanation, although later we return to the issue of differences in timing between self- and peer-ratings.

**Expression–experience discrepancies for negative and positive emotions.** For ratings of the expression versus the experience of emotions during negative and positive daily events, 197 participants had data sufficiently complete for analysis. For each participant, the average discrepancy between *expression* and *experience* for each of the 17 emotions was computed, with a positive value suggesting up-regulation of expression and a negative value suggesting suppression. As shown in Table 3, the average discrepancy between expression and experience for each of the 17 emotions across daily events was significantly negative, suggesting that participants tended to suppress all emotions, both negative and positive, more than they up-regulated them.

Average expression–experience discrepancies for negative versus positive emotions were calculated for each participant. A paired-samples *t* test revealed that the average expression–experience discrepancy for negative emotions ( $M = -0.38$ ,  $SD = 0.33$ ) was larger than the discrepancy for positive emotions ( $M = -0.21$ ,  $SD = 0.25$ ),  $t(196) = 7.28$ ,  $p < .001$ ,  $d = 0.58$ , suggesting that participants suppressed their negative emotions more than they did their positive emotions.<sup>5</sup> A repeated-measures analysis of variance indicated that this effect was moderated by gender, with females showing a larger difference between the discrepancies for negative and positive emotions than males did,  $p < .01$ . However, even for males, the average expression–experience discrepancy for negative emotions was significantly larger than the discrepancy for positive emotions,  $p < .02$ .

**Within-subjects mediation analysis.** To test the mediational hypothesis that participants' preferential suppression of negative emotions (as compared to positive) may explain why peers made underestimation errors when assessing participants' negative emotions (vs. overestimation errors for positive emotions), we used the within-subjects mediation technique recommended by Judd, Kenny, and McClelland (2001). We included the subset of 123 participants who had scores for each of the four variables required for this type of analysis: expression–experience discrepancies for negative and positive emotions, respectively, and peers' estimation errors for negative and positive emotions, respectively.<sup>6</sup> The first of Judd et al.'s criteria for within-subjects mediation was met, with participants reporting a greater expression–experience discrepancy for negative emotions ( $M = -0.39$ ,  $SD = 0.32$ ) than for positive emotions ( $M = -0.19$ ,  $SD = 0.23$ ),  $t(122) = 6.09$ ,  $p < .001$ . To assess the second criterion, we computed both a difference score ( $D_{Di}$ ) and a centered sum score ( $D'_{Si}$ ) using the expression–experience discrepancies for negative and positive emotions and used both new composites to predict the difference in estimation errors ( $E_{Di}$ ) between positive and negative emotions, resulting in the regression equation  $\hat{E}_{Di} = .39 + .65 D_{Di} - .07 D'_{Si}$ . According to Judd et al., the significant .65 slope for  $D_{Di}$ ,  $t(120) = 3.14$ ,  $p = .002$ , combined with the significant .39 intercept,  $t(120) = 4.85$ ,  $p < .001$ , indicates successful partial mediation, whereas the nonsignificant  $-.07$  slope for  $D'_{Si}$ ,  $t(120) = -0.41$ ,  $p > .6$ , indicates no moderation by valence of the discrepancy–misestimation path. In other words, participants' preferential suppression of negative emotions (as compared to positive) explained, in part, why peers made underestimation errors when assessing participants' negative emotions (vs. overestimation errors for positive emotions).

## Discussion

In Study 2, peers underestimated the extent to which participants experienced negative emotions during their first term of college, whereas they made the opposite error for positive emotions. Thus, it appears that people misperceive the

emotional lives of specific peers—people they know well—in much the same way that they misperceive population norms (see Study 1b). In both cases, people perceive others' emotional lives as better than they actually are. The strikingly different overall research design of Study 2 compared to that of Study 1b, coupled with the fact that the data set in Study 2 was collected for purposes independent of the present series of studies, strengthens the claim that the emotional-estimation errors documented in Study 1b were not the result of methodological idiosyncrasies of that study.

Consistent with past research on emotion regulation (e.g., Gross et al., 2006), Study 2 participants reported greater experience than expression of both negative and positive emotions, suggesting that they tended to suppress emotions more than they up-regulated them. The expression–experience discrepancy was especially pronounced for negative emotions, and in our within-subjects mediation analysis, this preferential suppression of negative emotions partly mediated the difference in estimation errors between negative and positive emotions. That is, participants who showed the strongest preferential suppression of negative over positive emotions had peers who showed the largest errors in estimating the participants' actual negative versus positive emotions.<sup>7</sup> By demonstrating at the individual level one mechanism that may lead people to misperceive their peers' emotional lives, these results thus suggest a building block from which larger misperceptions of emotional norms at the population level may emerge.

We should return briefly to the issue of the temporal difference between self- and peer-ratings in this study. Prior research suggests that self-ratings for the extent of both negative and positive emotions increase slightly with longer time frames (e.g., the last month vs. the last day), presumably because over longer periods people really do experience more emotions (Watson, Clark, & Tellegen, 1988). Therefore, if participants in Study 2, rather than making weekly ratings (which were then averaged for analyses), had instead rated their emotions once at the end of the whole 10-week period, as their peers did, we might expect slightly higher self-ratings for both negative and positive emotions. In turn, these higher self-ratings would increase the magnitude of the peers' underestimation errors for negative emotions, whereas they would decrease (or possibly eliminate) peers' overestimation errors for positive emotions. We are thus highly confident that the underestimation of peers' negative emotions documented in Study 2 was not the result of the difference in time frames for self- versus peer-ratings, whereas we are more cautious in interpreting the apparent overestimation of positive emotions, especially since we did not find an overestimation for the prevalence of positive emotional experiences in Study 1.

How might believing others' emotional lives to be better than they really are affect people's own well-being? For example, are people lonelier and less satisfied with their own lives when they think other people's emotional lives are cheerier than they actually are (H4)? By examining correlates of errors in

the perception of others' emotional lives, Study 3 was designed to shed light on this question.

### Study 3: Are Misperceptions of the Peer Prevalence of Emotional Experiences Associated With Reduced Well-Being?

The results of Studies 1b and 2 paint a picture of individuals out of touch with socioemotional reality, consistently underestimating the overall peer prevalence of negative emotional experiences, and even underestimating the extent of negative emotions experienced by close friends. Although social-cognitive perceptual errors such as these may at first glance seem inherently dysfunctional, some mistaken perceptions have been shown to contribute to well-being (Dunning, Heath, & Suls, 2004; Taylor & Brown, 1988). However, we predict, based on the social comparison literature (e.g., Wheeler & Miyake, 1992), that the biases documented in this article will result in decreased standing on well-being and adjustment measures (H4). For example, feeling alone in negative emotional experiences may lead people to pathologize these experiences and brood over them unnecessarily, while also promoting a general sense of loneliness. Furthermore, the more emotionally gratifying people believe their peers' lives to be, the harder it may be for them to feel satisfied with their own lives.

Study 3 was designed to identify correlates of errors in the perception of others' emotional lives by including measurements of participants' loneliness, rumination, depressive symptoms, satisfaction with life, and subjective happiness. Our main predictions for Study 3 were that lower estimates of other people's negative emotional experiences, and higher estimates of others' positive emotional experiences, would be associated with more loneliness, rumination, and depressive symptoms and with lower satisfaction with life and subjective happiness. We also predicted that people with fewer peers who were open about their emotional lives would be less accurate in their perceptions, making smaller estimates of other people's negative emotional experiences and higher estimates of others' positive emotional experiences.

In addition, Study 3 was designed to address a limitation in Study 1b: Because items for Study 1b were, to varying degrees, conjunctions of an emotionally valenced event and an associated intensity of response (e.g., "received a low grade and felt really bad about it"), it was unclear in some cases whether participants were underestimating the peer prevalence of negative emotional events (e.g., receiving a low grade) or, instead, were denying only that the experiences evoked a specified intensity of response in many of their peers (e.g., feeling really bad). The latter interpretation of Study 1b could be posited based on the tendency to suppress negative emotions that was documented in Studies 1a and 2

as well as past studies in which people have underestimated the degree of discomfort others would feel in uncomfortable situations (McFarland & Miller, 1990), the proportion of their peers who would feel negative emotions in response to emotion-eliciting stimuli (Sabini, Cosmas, Siepmann, & Stein, 1999), and the intensity of aversion that others would feel in response to negative stimuli (Chambers & Suls, 2007). To test more rigorously the specific claim that people underestimate the peer prevalence of negative emotional events, participants in Study 3 estimated the peer prevalence of the emotional events used in Study 1b, but these events were stripped of the markers of emotional intensity conjoined to them in Study 1b.

### Method

**Participants.** From a pool of online study participants maintained at a medium-sized West Coast university, 104 students (53 female) volunteered to complete an Internet survey in exchange for payment.

**Procedure.** Participants first estimated the percentage of their peers who had had, in the past 2 weeks, each of the 12 emotional experiences generated by students in Study 1a and used in Study 1b. For the purposes of the present study, each of these items was stripped of markers of intensity of emotional response as much as possible. Next, participants completed a short-form version of the UCLA Loneliness Scale (Hays & DiMatteo, 1987; Russell, Peplau, & Cutrona, 1980), the Brooding subscale of the Ruminative Responses to Depression Questionnaire (Nolen-Hoeksema, 1991; Treynor, Gonzales, & Nolen-Hoeksema, 2003), a short-form version of the Center for Epidemiologic Studies Depression Scale (Cole, Rabin, Smith, & Kaufman, 2004; Radloff, 1977), the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), and the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). In addition, participants specified the number of friends they had at their university who felt comfortable talking to them about personal problems in their lives (hereafter referred to as "confidants").

### Results

**Prevalence estimates for negative and positive emotional experiences.** Table 4 shows the reported prevalence of each experience among the participants as well as their average estimates of prevalence. For all six of the negative emotional experiences, participants underestimated peer prevalence, one-sample *t* tests, all *ps* < .001. Participants overestimated the prevalence of three of the positive experiences and underestimated the prevalence of one of them, one-sample *t* tests, *ps* < .001, whereas estimates for two of the positive experiences did not differ significantly from the reported prevalence figures—a replication of the results of Study 1b. The average estimation error for the negative emotional experiences was an underestimate of 21.4 percentage points (*SD* = 8.7), which

**Table 4.** Estimation Errors for the Prevalence of Negative and Positive Emotional Experiences (Study 3)

Experience	Percentage of classmates who have had experience in past 2 weeks			Estimation error (estimated – reported)
	Estimated	SD	Reported	
<b>Negative experiences</b>				
Had fight/argument	29.5	17.7	43.3	-13.8***
Thought about distant friends/family	59.3	23.4	85.6	-26.3***
Thought about enormous workload	78.1	15.6	89.4	-11.3***
Was rejected by boy/girl	19.1	11.3	37.5	-18.4***
Received low grade	37.3	16.1	60.6	-23.3***
Thought about bad personal health habits	44.8	23.5	79.8	-35.0***
<b>Positive experiences</b>				
Received high grade	64.1	22.1	64.4	-0.3
Attended fun party	54.5	20.6	41.3	+13.2***
Participated in athletics	56.6	19.7	49.0	+7.6***
Went out with friends	49.0	21.4	37.5	+11.5***
Talked to distant friends/family	52.6	20.2	62.5	-9.9***
Had great meal	54.3	20.9	53.8	+0.5

\*\*\* $p < .001$ .**Table 5.** Predicting Well-Being Measures From Prevalence Estimates (Study 3)

Life-quality measure	<i>M</i>	<i>SD</i>	Cronbach's $\alpha$	$\beta$ for negative prevalence estimate	$\beta$ for positive prevalence estimate	$R^2$
<b>Negative</b>						
Loneliness	17.0	4.5	.81	-.30**	.08	.08
Rumination/brooding	10.7	3.3	.72	-.28**	.17	.08
Depressive symptoms	8.8	4.7	.73	.00	-.02	.00
<b>Positive</b>						
Satisfaction with life	24.5	4.6	.84	.23*	-.37***	.15
Subjective happiness	4.8	1.1	.80	.19	-.16	.05

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

differed significantly from the average estimation error for the positive emotional experiences, an overestimate of 3.8 percentage points ( $SD = 8.7$ ),  $t(10) = 4.99$ ,  $p = .001$ ,  $d = 3.16$ . Overall, estimation errors for the negative experiences differed significantly from zero, one-sample  $t(5) = 5.99$ ,  $p < .01$ , whereas estimation errors for the positive experiences did not differ significantly from zero, one-sample  $t(5) = 1.06$ ,  $ns$ .

**Correlates of prevalence estimates.** To determine the correlates of peer-prevalence estimates for negative and positive emotional experiences, we first computed an average of each participant's prevalence estimates for the six negative experiences ("negative prevalence estimate";  $M = 44.7$ ,  $SD = 10.1$ ) and an average of each participant's prevalence estimates for the six positive experiences ("positive prevalence estimate";  $M = 55.2$ ,  $SD = 9.2$ ). Thus, participants with higher negative prevalence estimates thought that a greater percentage of their peers had had the negative emotional experiences and participants with higher positive prevalence estimates thought that a greater percentage of their peers had had the positive emotional experiences. Negative prevalence

estimates were positively correlated with positive prevalence estimates,  $r = .27$ ,  $p < .01$ .<sup>8</sup>

Next, as shown in Table 5, for each of the five measures related to well-being, we built a regression model predicting scores on the scale from negative prevalence estimates and positive prevalence estimates (this accounted for shared variance between negative and positive estimates). Consistent with our predictions, negative prevalence estimates were negatively related to scores on the Loneliness scale,  $\beta = -.30$ ,  $t(101) = 3.02$ ,  $p < .01$ , and the Brooding subscale,  $\beta = -.28$ ,  $t(101) = 2.86$ ,  $p < .01$ , and positively related to scores on the SWLS,  $\beta = .23$ ,  $t(101) = 2.44$ ,  $p < .02$ . Also consistent with our predictions, positive prevalence estimates were negatively related to scores on the SWLS,  $\beta = -.37$ ,  $t(101) = 3.89$ ,  $p < .001$ . In other words, the lower participants' estimates of others' negative emotional experiences, the more they reported feeling lonely and brooding over their personal problems and the less they reported feeling satisfied with life. The higher participants' estimates of others' positive emotional experiences, the less they reported feeling satisfied with life.

Prevalence estimates did not significantly predict scores on the other measures, and there was no significant correlation between number of confidants and prevalence estimates.

### Discussion

The key effects from Study 1b were replicated in Study 3: Participants underestimated the prevalence of negative emotional experiences among their peers but did not make such errors, on average, for positive emotional experiences (supporting H2a and H2b), even when markers of emotional intensity were removed from descriptions of the experiences. Furthermore, Study 3's results suggested possible correlates of errors in perceiving others' emotional lives. Participants who thought that negative emotional experiences were rarer among their peers reported greater loneliness, more brooding over their personal problems, and less satisfaction with life, whereas participants who thought that positive emotional experiences were more common among their peers reported less satisfaction with life (in partial support of H4). On the other hand, perceptions of others' emotional lives did not significantly predict depressive symptoms or subjective happiness. Although our investigation was motivated by the idea that prevalence estimates for emotional experiences may affect well-being, an interventional study would be needed to establish this direction of causation, and we discuss below not only this interpretation of our results but also the alternative interpretation that well-being affects people's prevalence estimates for emotional experiences.

For exploratory purposes, we included in this study a measure of how many close confidants each participant had. We reasoned that if people have a sufficient number of close friends who can share their emotional lives openly, this might help to counter the misperception of peers' emotional lives that we have seen in our studies. However, we found no correlations between number of confidants and perceptions of peers' emotional lives. Taken in combination with the results of Study 2—in which people underestimated the extent of negative emotion even in specific well-known peers' lives (a group that likely overlaps with “confidants”)—this suggests that the factors driving misperceptions of others' emotional lives may be quite robust, rather than being limited to superficial social situations.

*Prevalence estimates may affect well-being.* Because social comparisons, both upward and downward, can affect people's well-being (Olson & Evans, 1999; Wheeler & Miyake, 1992), it is plausible that perceptions of peers' emotional lives may affect the quality of people's own emotional lives and that the relationships in Study 3 between well-being measures and perceptions of the commonality of emotional experiences may be the result of such a process. From this perspective, the connection between perceiving a lower prevalence of negative experiences and greater loneliness seems fairly straightforward to interpret. The UCLA Loneliness Scale asks participants to

indicate, for example, how often they “feel isolated from others.” Thinking that few other people go through negative emotional experiences may make people prone to feeling isolated and lonely in their own problems. Furthermore, given that loneliness has been linked longitudinally to depression (e.g., Rich & Scovel, 1987; Treynor et al., 2003), it is possible that if the college students in our study were tracked for a longer time, those who perceived a low peer prevalence of negative emotional experiences may begin to show depression later on, although they did not in the current study. Like loneliness, rumination over personal problems was related to perceiving a lower peer prevalence of negative experiences. This connection again seems logical: the Brooding subscale of the Ruminative Responses to Depression Questionnaire asks respondents to indicate how often they think things such as “Why do I have problems other people don't have?” and “Why do I always react this way?” when they feel “down, sad, or depressed.” A higher score on this scale thus indicates that respondents tend to dwell self-critically on their negative times in life—a tendency especially common among participants who thought that negative emotional experiences were relatively rare among their peers.

Why did participants who perceived a greater prevalence of positive emotional experiences among their peers, and a lesser prevalence of negative emotional experiences, show lower scores on the SWLS but not the SHS? An examination of the items composing each scale suggests that the SHS measures stable temperament or affect (a happy disposition), whereas the SWLS measures the cognitive evaluation of one's current life circumstances compared to a subjectively constructed set of standards (happiness with one's life; see Pavot & Diener, 1993). For example, on the SHS, respondents are asked to indicate the degree to which they “are generally very happy” and “enjoy life regardless of what is going on, getting the most out of everything,” whereas on the SWLS respondents are asked about the degree to which “the conditions of [their] life are excellent.” Thus, it may be that when considering their answers to the questions on the SWLS, participants were thinking about how many good times or bad times they had in their lives, compared to norms among their peer group, whereas they may have thought only about their overall temperament when answering questions on the SHS.

*Well-being may affect prevalence estimates.* The results of Study 3 are also open to an alternative, equally plausible interpretation: People's well-being may affect their perceptions of others' emotional lives. In particular, some researchers have argued that negative affect promotes negative cognition, perhaps including thoughts that the self is inferior to other people (e.g., Bower, 1981, 1991). In other words, feeling bad may prime thoughts that have been associated with bad feelings in the past, such as upward social comparisons. Indeed, when people are experimentally induced to feel negative affect, they are thereafter apt to make mood-congruent negative judgments

about themselves (Forgas, Bower, & Krantz, 1984; Forgas, Bower, & Moylan, 1990). It is plausible, then, that lonely, ruminative participants in Study 3, and those who were less satisfied with their lives, estimated that their peers' emotional lives were better than they actually were simply because this type of perception ("everyone else is doing well in life") was made accessible by their negative affective state (although it is not obvious why depression and low subjective happiness would fail to have a similar effect).

Given the evidence that people in negative affective states, compared to those in positive states, tend to make upward social comparisons, and yet these comparisons in turn tend to make them feel even *worse* (Giordano et al., 2000; Wheeler & Miyake, 1992; Wood, Michela, & Giordano, 2000), we believe that our results in Study 3 might best be explained via both causal interpretations we have posited: Overestimating the quality of peers' emotional lives may make people feel more lonely, more ruminative, and less satisfied with their own lives; these feelings may then engender further overestimations of the quality of others' emotional lives, which in turn may exacerbate negative affect, and so on, in a vicious circle.

## General Discussion

In the series of studies presented here, people consistently underestimated the overall peer prevalence of negative emotional experiences (Studies 1b and 3) and the extent of negative emotions in close peers' lives (Study 2). The picture for positive emotions was less consistent: People accurately estimated the overall peer prevalence of positive emotional experiences (Studies 1b and 3) and overestimated the extent of positive emotions in well-known peers' lives (Study 2). The difference between estimation errors for the extent of negative and positive emotions in peers' lives was partially mediated by the preferential suppression of negative emotions (Study 2) and seems to also be the result of the fact that negative emotional experiences occur more frequently in solitary settings and are talked about less often than positive emotional experiences (Study 1a). Lower estimates of the prevalence of negative emotional experiences predicted greater loneliness, greater rumination over personal problems, and lower satisfaction with life, and higher estimates of the prevalence of positive emotional experiences predicted lower life satisfaction (Study 3), although the causal relation must await future research.

In some ways, these results seem straightforward: If negative emotional experiences are more difficult for outsiders to observe than are positive ones, then naturally people would underestimate the prevalence of the former compared to the latter. But even if many negative experiences occur in solitude, away from observers, why wouldn't people recognize their own solitary emotional experiences and assume that other individuals probably have similar experiences? Similarly, if people tend to suppress their negative emotions in

public to comply with perceived norms, why wouldn't they expect such behavior in others? In general, why wouldn't people recognize the biases in the information they receive about others' emotional lives and revise their cognitions accordingly?

The puzzle of people's errors in perceiving the collective has its roots in core social-cognitive tendencies, as pluralistic ignorance researchers have noted (e.g., Miller & McFarland, 1987). Research on the fundamental attribution error (Ross, 1977) and the actor-observer bias (Jones & Nisbett, 1971) suggests that situational variation looms larger in the explanation of people's own behaviors than in the explanation of others' behaviors. Even while recognizing that their *own* lack of negative emotions (and negative emotional expression) in social contexts may be partly the result of the situation, people are likely to ascribe *others'* apparent well-being in social settings to genuine, stable contentment across all settings. Thus, despite the well-documented motivation to see the self as better than others (e.g., Pyszczynski & Greenberg, 1987), pluralistic ignorance can lead people to misperceive themselves as emotionally worse off, relative to their peers, than they actually are.

## Social Consequences of Emotion Regulation

Past research has shown that suppressing emotions (typically negative emotions) is associated with less social support, more depressive symptoms, lower well-being, and less life satisfaction (e.g., Gross & John, 2003; Srivastava et al., 2009). Apparently, the chronic suppression of emotions is bad for people's well-being. Our results suggest that such suppression might also be bad for peers in people's social networks: the more that participants in Study 2 showed preferential suppression of negative emotions, the greater their peers' errors in overestimating the quality of their emotional lives, and such errors were associated with loneliness, rumination, and reduced life satisfaction in Study 3. The social consequences of individual differences in emotion regulation may thus be even wider reaching than previously thought, although we must note again that these studies were correlational in design; establishing causation will require further research.

## Distorted Perceptions of Peers' Social Lives

We found in Study 3 that lower estimates of the peer prevalence of negative emotional experiences were associated with greater reported loneliness. This association suggests that it may be fruitful in future research to directly measure people's perceptions of their peers' social relationships. One of the factors likely leading to distorted perceptions of others' emotional lives—the fact that other people can be observed directly only in social settings—may also cause people to think that others experience more social contact, and less solitude, than

they actually do. A university student who goes out on the weekend to grab a slice of pizza with friends, for example, sees only those fellow students who are also out socializing, not those who are spending their evenings watching television alone in their dorm rooms. Indeed, participants in Studies 1b and 3 overestimated the number of their peers who were going out and attending parties.

### Understanding the Appeal of Tragedy

Understanding the errors that people make in perceiving others' emotional lives—and the potential consequences of those errors—may shed light on why people seek out works of art that depict the pains of others. In fictional tragedy, people are given the opportunity to witness “the terrible things in life” that are ordinarily “played out behind the scenes” (Chekhov, 1898/1979, p. 192), which may help to depathologize people's own negative emotional experiences. As screenwriter Charlie Kaufman said in an interview, “If I see something expressed, something that's sad in a work of art, [it's] not necessarily grim to me if I can relate to it. . . . I say, ‘Oh my God, there's somebody else in the world that I'm related to’” (Faraci, 2008). In a related vein, research on errors in the perception of others' emotional lives may help to explain why Internet users read sad online diaries or notes of others (e.g., postsecret.com) or visit sites that document the pitfalls of celebrities' personal lives (e.g., TMZ.com); such sites may help visitors feel less alone in their own problems. On the other hand, social networking sites (e.g., Facebook.com) may exacerbate common misperceptions of others' emotional lives because of the complete control that users have over the public image they project to the world through their photo albums, status updates, friendship networks, and so forth.

### Conclusion

In this series of studies, we have demonstrated that people make systematic errors in perceiving others' emotional lives, underestimating the extent to which other people suffer negative emotional experiences and sometimes overestimating the extent of others' positive emotions. These errors are associated with loneliness, rumination, and reduced satisfaction with life and are caused, in part, by people's preferential suppression of negative emotion. This research suggests possible social consequences of variations in emotion regulation—and suggests the value of extending the venerable social-psychological literatures on pluralistic ignorance and self-evaluative social comparison into the domain of emotional experience. We believe that further research on this topic has the potential to illuminate everyday phenomena such as people's enjoyment of tragic fiction and eventually may lead to the creation of novel interventions to increase well-being and decrease loneliness.

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### Notes

1. From this point forward, we use the simple term *suppression* to refer to the suppression of expressive behavior.
2. We expected only partial mediation here because we posit two other critical factors driving people's misperceptions of others' emotional lives—H1a and H1c.
3. For brevity's sake, the ancillary tests reported for our pilot study—whether medians were in the same directions as means and whether estimation errors depended on a participant's having had (or not had) an experience—are not reported for the following studies since the results of these tests were consistent with the pilot and were not a primary focus of this research. Likewise, gender effects are reported only for moderation of the key effects related to our hypotheses (rather than, for example, simple prevalence rates of emotional experiences).
4. The covertness effects reported earlier for the total set of negative and positive experiences held true for the subset of experiences that were categorized as belonging to the 12 most common types.
5. Paired-samples *t* tests revealed that the average expression of positive emotions ( $M = 1.27$ ,  $SD = 0.55$ ) was greater than the average expression of negative emotions ( $M = 0.58$ ,  $SD = 0.39$ ),  $t(196) = 16.25$ ,  $p < .001$ ; likewise, the average experience of positive emotions ( $M = 1.48$ ,  $SD = 0.54$ ) was greater than the average experience of negative emotions ( $M = 0.96$ ,  $SD = 0.52$ ),  $t(196) = 10.88$ ,  $p < .001$ .
6. The key effects reported above for the subsets of 140 and 197 participants held true for this subset of 123.

7. An interesting question, given the overall trend to suppress rather than up-regulate the expression of positive emotions (though this tendency was weaker than for negative emotions), is why peers overestimated the extent of positive emotions in participants' lives. One possibility is that although instances of suppression may have led peers to believe that participants felt slightly less positive emotion in public settings than they actually did, these peers assumed that participants felt just as good in private settings as they did in public, whereas people actually tend to feel less positive and more negative emotions in private.
8. Although, analyzed separately by experience, participants who had had a specific experience tended to estimate its prevalence as greater than did participants who had not had that same experience, average prevalence estimates collapsed across experiences within each participant, negative and positive, were not correlated with the total number of experiences that the participant had had, negative and positive. Thus, when analyzed by aggregating across experiences within participants, negative- and positive-prevalence estimates were not confounded with the total number of negative or positive experiences that a participant had had.

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