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Empathy Gaps for Social Pain: Why People Underestimate the Pain of Social Suffering

Loran F. Nordgren
Northwestern University

Kasia Banas
VU University Amsterdam

Geoff MacDonald
University of Toronto

In 5 studies, the authors examined the hypothesis that people have systematically distorted beliefs about the pain of social suffering. By integrating research on empathy gaps for physical pain (Loewenstein, 1996) with social pain theory (MacDonald & Leary, 2005), the authors generated the hypothesis that people generally underestimate the severity of social pain (ostracism, shame, etc.)—a biased judgment that is only corrected when people actively experience social pain for themselves. Using a social exclusion manipulation, Studies 1–4 found that nonexcluded participants consistently underestimated the severity of social pain compared with excluded participants, who had a heightened appreciation for social pain. This empathy gap for social pain occurred when participants evaluated both the pain of others (interpersonal empathy gap) as well as the pain participants themselves experienced in the past (intrapersonal empathy gap). The authors argue that beliefs about social pain are important because they govern how people react to socially distressing events. In Study 5, middle school teachers were asked to evaluate policies regarding emotional bullying at school. This revealed that actively experiencing social pain heightened the estimated pain of emotional bullying, which in turn led teachers to recommend both more comprehensive treatment for bullied students and greater punishment for students who bully.

Keywords: empathy gaps, social pain, social exclusion

> Jenny, a fourth-grade student, is widely regarded to be the least popular student at school. She has few friends and little opportunity for social interaction. Her classmates do their best to avoid her. They openly display their disgust for her and act as though anything she touches is contaminated by "Jenny germs." When a teacher asked Jenny how the taunting makes her feel, she said, "It hurts. It really, really, hurts."
>
> —Event described by a schoolteacher to Loran F. Nordgren

As Jenny's description attests, the language of physical pain—hurt, ache, burn, bite—is often used to describe experiences of social distress—hurt feelings, heartache, stinging criticism, and so on. This linguistic analogy between the physical and social experiences of pain appears to be more than a metaphor. A wide range of cultures use the same words to describe the experiences of social and physical injury (MacDonald & Leary, 2005). In fact, in English and many other languages, it is nearly impossible to express the concept of social pain without referring to physical pain (Leary & Springer, 2001).

Beyond the linguistic parallels, considerable evidence suggests that the pain derived from social distress shares phenomenological, neurological, and psychological correlates with physical pain (Eisenberger & Lieberman, 2004; MacDonald & Leary, 2005; Panksepp, 1998). Indeed, reactions to social exclusion mirror the consequences of physical injury, such as temporary numbness (DeWall & Baumeister, 2006) and heightened aggressiveness (Twenge, Baumeister, Tice, & Stucke, 2001). In addition, sensitivity to physical pain is positively correlated with sensitivity to social pain (Eisenberger, Jarcho, Lieberman, & Naliboff, 2006).

Perhaps the best evidence for the overlap between physical and social pain in humans comes from research showing that responses to both forms of injury appear to share a number of physiological mechanisms. For example, social exclusion activates the dorsal anterior cingulate cortex and right ventral prefrontal cortex (Eisenberger, Gable, & Lieberman, 2007; Eisenberger, Lieberman, & Williams, 2003; Eisenberger, Way, Taylor, Welch, & Lieberman, 2007), brain areas shown to respond specifically to the affective dimension of physical pain experience (e.g., Rainville, Duncan, Price, Carrier, & Bushnell, 1997). Levels of endogenous opioids, well-known for their role in reducing physical pain, have been shown to decrease in response to recalling experiences of social loss (Zubieta et al., 2003). Even acetaminophen, an over-the-counter painkiller, has been shown to reduce daily diary reports of hurt feelings and diminish neural responsiveness to acute social exclusion (DeWall et al., in press).

Loran F. Nordgren, Department of Management and Organizations, Kellogg School of Management, Northwestern University; Kasia Banas, Department of Psychology, VU University Amsterdam, Amsterdam, the Netherlands; Geoff MacDonald, Department of Psychology, University of Toronto, Toronto, Ontario, Canada.

Correspondence concerning this article should be addressed to Loran F. Nordgren, Department of Management and Organizations, Kellogg School of Management, Northwestern University, 2001 Sheridan Road, Evanston, IL 60208. E-mail: l-nordgren@kellogg.northwestern.edu

The (Mis)Estimation of Social Pain

Although knowledge regarding the experience and consequence of social pain is growing rapidly (MacDonald & Jensen-Campbell, 2010), people's beliefs about the severity of social pain and the accuracy of these beliefs in relation to the actual experience of social pain is poorly understood. We argue that estimates of social pain are important because they govern people's reaction to socially painful events, as well as guide their approach to the many decisions and policies that address socially painful experiences. For example, should the school intervene when students like Jenny are ostracized? And what punishment, if any, is appropriate for students that bully? The answer seems to rest on one's beliefs about the severity of social pain. If social pain is considered to be a deeply traumatic experience, people should recommend greater intervention and punishment than if they think of social pain as a negative but trifling experience. The case of bereavement raises similar issues. When an employee loses a close friend or family member, how much paid leave of absence is appropriate? And when should the employer expect the employee to be "fit for duty"? Again, the greater the estimated severity of the pain, the more accommodating the employer should be.

Each of these examples reflects how estimates of social pain can inform people's decisions about socially distressing events and highlights the need for an accurate understanding of the experience of social pain—employers need to know what bereavement is like if workplaces are to have a fair and effective leave of absence policy, for instance. Yet, in this article, we argue that people systematically underestimate the severity of social pain, and their biased estimate is only corrected when people actively experience social pain for themselves. To understand the basis for this prediction, we turn to research on the empathy gap effect.

Empathy Gaps for Physical Pain

Numerous studies have found that people tend to exhibit what Loewenstein (1996) has termed a *cold-to-hot empathy gap*: the tendency for people in a cold state (i.e., not experiencing hunger, pain, sexual arousal, etc.) to underestimate the influence a hot, visceral state will have on their preferences and behavior. Loewenstein (1996) has argued that the underestimation of visceral states is due to people's constrained memory for visceral experience. That is, although people can recall the circumstances that led to a visceral state (e.g., I was hungry because I didn't eat all day) and can recall the relative strength of a visceral state (e.g., that was the most hungry I have ever been), they cannot freely bring forth the sensation of the visceral state itself.

Empathy gap effects have been found across a variety of visceral states, including sexual arousal (Ariely & Loewenstein, 2006; Nordgren, van der Pligt, & van Harreveld, 2007), hunger (Nordgren, van Harreveld, & van der Pligt, 2009), fear (Van Boven, Loewenstein, & Dunning, 2005), and drug craving (Sayette, Loewenstein, Griffin, & Black, 2008). Empathy gap effects have also been demonstrated for physical pain. That is, people who are not actively experiencing physical pain tend to underestimate pain's severity and influence on behavior. The medical literature has consistently found that physicians underestimate the severity of their patients' pain (Hodgkins, Albert, & Daltroy, 1985; Kappesser, Williams, & Prkachin, 2006; Marquié et al., 2003; Pasero & McCaffery, 2001). There is also evidence that patients underestimate the severity of the pain associated with upcoming medical procedures. For example, one study found that the majority of pregnant women who intended to go without anesthesia during childbirth reversed their decisions once they went into labor, suggesting that they had initially underestimated the intensity of the pain of childbirth (Christensen-Szalanski, 1984).

In a laboratory study Read and Loewenstein (1999) asked participants whether they would be willing to undergo pain in exchange for monetary compensation. Some participants experienced a sample of the pain while they made their decision, whereas other participants experienced the sample pain 1 week before they made their decision (and thus made their decision pain free). Consistent with the cold-to-hot empathy gap, participants who experienced the pain while they made their decision demanded higher compensation than did those who experienced the pain just 1 week earlier.

In another experiment, Nordgren, van der Pligt, and van Harreveld (2006) used pain to hinder participants' performance on a memory test. Later on, participants were asked to indicate how the pain and various other factors affected their performance. They found that participants who made their attributions in a cold state (i.e., pain free) underestimated the influence pain had on their performance—only participants who made their attributions while experiencing pain accurately assessed its influence.

The Present Studies

If social pain operates along some of the same mechanisms as physical pain, then people may experience empathy gaps for social pain as they do for physical pain. That is, people who are not actively experiencing social pain (i.e., cold state) should underestimate the severity of a socially painful event, whereas people who are experiencing social pain (i.e., hot state) should have a more accurate understanding of its severity. In Studies 1 and 2, we tested this prediction by manipulating social pain through a Cyberball task (Williams, Cheung, & Choi, 2000) and then asking participants to evaluate scenarios that involved social exclusion (as well as other negative events).

In Studies 3 and 4, we tested the objective accuracy of people's estimates of social pain. In Study 3, dyad members were randomly assigned to one of two conditions: the actor or the observer. Actors rated the social pain they experienced while playing Cyberball and observers estimated the pain the actors experienced, thereby enabling us to measure the objective accuracy of the observers' estimates. Study 4 examined whether people would exhibit empathy gaps when recalling a time when they themselves were socially excluded—an *intrapersonal* empathy gap for social pain. As such, Study 4 provided a more conservative test of the empathy gap for social pain hypothesis—as it deals with one's own behavior—and helped to establish the objective accuracy of people's estimates of socially painful events.

We believe that the biased estimate of social pain is important because it governs how people react to socially distressing events. In Study 5, we examined how the underestimation of social pain affects teachers' policies toward emotional bullying in school. We assigned middle school teachers to a social exclusion manipulation and then asked them to evaluate a vignette involving bullying at school. We then examined how the teachers' beliefs about social

pain influenced their policies regarding emotional bullying at school.

Study 1

Study 1 tested the hypothesis that people not actively experiencing social pain would consider socially distressing events to be less painful compared with people who are actively experiencing social pain. To test this prediction, we randomly assigned participants to be excluded (i.e., social pain) or included (i.e., no pain) in a computer ball toss game (Cyberball; Williams et al., 2000) or to a control condition in which they did not play the game. After the manipulation, participants read about several negative events and then estimated the severity of the pain experienced at each event. Two of these negative events involved social exclusion, whereas the other events involved disappointment, fear, or anger. We predicted that participants who were excluded would estimate socially painful events to be more painful relative to participants who were not excluded. We expected no differences by condition for the other negative incidents.

Method

Participants. Seventy-one students (43 women and 28 men) from a Dutch university participated for course credit.

Procedure. Participants completed the study in private cubicles. Participants first played Cyberball, a social exclusion manipulation (Williams et al., 2000). In this task, participants played an online ball-tossing game, ostensibly with two other college students who were identified by first name (e.g., Frank and Anna). In fact, participants played the game with a preprogrammed computer. The number of times participants received the ball depended on the condition to which they were assigned. Participants in the inclusion condition received the ball one third of the total number of throws, whereas those in the exclusion condition received the ball 10% of the time. Participants in the control condition did not complete the Cyberball task.

Participants next evaluated the negative events. Two of these events involved social exclusion and the others involved either disappointment, fear, or anger. The events were presented in random order. Participants were asked to estimate how they would feel if they experienced each of the following five events: (a) learning your close friends did not invite you to their party (social exclusion), (b) asking someone out on a date and getting turned down (social exclusion), (c) getting a bad grade on a test (disappointment), (d) finding a spider in your bed (fear), and (e) discovering someone stole your wallet (anger).

Each event was evaluated on the Faces Pain Scale—Revised (Bieri, Reeve, Champion, Addicoat, & Ziegler, 1990), a common scale for measuring pain intensity. The measure contains human faces distributed across an 11-point scale. The faces vary in terms of the magnitude of pain they express, with higher scores reflecting greater pain. Participants were asked to "please indicate the face that best reflects how this event would make you feel." We then created a social exclusion scale averaging scores for the two exclusion items ($\alpha = .78$). Finally, participants in the exclusion and inclusion conditions were asked to evaluate their experience playing Cyberball with the following question: "How would you describe your experience playing the Cyberball game?" The question was assessed on a 50-point scale with the following three scale labels: −25 (*extremely negative*), 0 (*neither negative nor positive*), and 25 (*extremely positive*). This question was designed as a manipulation check.

Results and Discussion

Manipulation check. The manipulation was successful. Participants in the exclusion condition had a less favorable experience playing Cyberball ($M = -3.95$, $SD = 5.87$) compared with participants in the inclusion condition ($M = 3.31$, $SD = 4.58$), $F(1, 44) = 21.67$, $p = .001$, $\eta^2 = .33$.

Primary analysis. We first examined whether rating of the social exclusion scenarios differed by condition. In line with our predictions, participants in the exclusion condition judged the social exclusion scenarios to be more painful ($M = 4.56$, $SD = 1.30$) than did participants in the inclusion condition ($M = 3.65$, $SD = 1.11$), $F(1, 46) = 6.59$, $p = .01$, $\eta^2 = .13$, and in the control condition ($M = 3.41$, $SD = 0.39$), $F(1, 47) = 11.98$, $p = .001$, $\eta^2 = .20$.

We predicted that experiencing social pain would enable participants in the exclusion condition to have a richer understanding of social exclusion but would not influence how they evaluated other negative events. As predicted, pain ratings did not differ by condition for any of the other negative emotion events. For the anger scenario, pain estimates in the exclusion condition ($M = 4.87$, $SD = 1.62$) did not differ from pain estimates in the inclusion condition ($M = 5.04$, $SD = 2.05$) or the control condition ($M = 4.68$, $SD = 1.61$), *ns*. In the fear scenario, pain estimates in the exclusion condition ($M = 5.20$, $SD = 2.02$) also did not differ from pain estimates in the inclusion condition ($M = 5.34$, $SD = 1.49$) or the control condition ($M = 4.99$, $SD = 1.69$), *ns*. And in the disappointment scenario, pain estimates in the exclusion condition ($M = 3.16$, $SD = 1.30$) did not differ from pain estimates in the inclusion condition ($M = 3.39$, $SD = 1.40$) or the control condition ($M = 3.29$, $SD = 1.26$), *ns*.

We explain our effects in terms of the enhanced perspective taking of the exclusion condition—by actively experiencing social pain, individuals can understand its motivational force in a way that cold state participants cannot. Another explanation for this finding is that inducing social pain has a generalized effect on decision making. For example, social pain might have served as information across all the events, leading participants in the exclusion condition to rate all of the negative events as more painful. That we only found differences for the two social exclusion scenarios suggests this is not the case and gives support to our enhanced perspective-taking argument.

Study 2

In Study 1, we found that people who were actively experiencing social pain had a heightened estimate of the pain of social suffering. It is important to note that we found that this difference did not occur for all judgments, only for those judgments specifically related to social pain. Our aim in Study 2 was to replicate this effect while ruling out an alternative explanation for our findings. We argue that people have difficulty appreciating the full severity of social suffering unless they themselves are actively experiencing social pain. An alternative explanation for Study 1 is

that any aversive experience—and not specifically social pain—would elevate estimates of social suffering. To test whether our findings are specific to social pain, we randomly assigned participants to inclusion, exclusion, or negative feedback conditions and then asked participants to evaluate a brief scenario involving social pain. We predicted that although participants in both the exclusion and the negative feedback conditions would find Cyberball to be a negative experience, only participants who were experiencing social pain (i.e., in the exclusion condition) would have heightened pain estimates.

Method

Participants. Seventy-four students (39 women and 35 men) from a U.S. university participated for $7.

Procedure. Participants were randomly assigned to the negative feedback, inclusion, or exclusion conditions. The latter two manipulations were identical to those used in Study 1. The goal of the negative feedback condition was to expose participants to a negative but nonexclusionary event. To do this, we had participants in the negative feedback condition perform the identical Cyberball manipulation used in the inclusion condition. This was done to ensure that any differences related to the negative feedback condition could not be attributed to a lack of exposure to the Cyberball task. After completing the Cyberball task, participants in the negative feedback condition were told that the Cyberball task was actually a tool designed "to measure short-term memory, a cognitive ability that is a primary predictor of intelligence."

Participants in this condition were then asked a series of difficult multiple-choice questions that probed their memory for details of the Cyberball task, such as "How many total throws were made during the game?" "Who received the Cyberball on the fourth throw?" and "What color was the Cyberball?" After answering these questions, all participants in the memory condition were told that "the handbook of cognition divides short-term memory performance into four categories: superior, above average, below average, and impaired. You answered three of the 10 questions correctly, which falls into the below average category."

In an ostensibly unrelated study, participants next evaluated the following scenario involving social pain:

> Anna is one of the least popular girls in school. She has little contact with her classmates. When they do interact, they often tease her for being overweight and wearing unfashionable clothes. Roger teases her more than any other classmate. For example, when Anna walks to the front of the class, Roger will yell, "Earthquake!" in reference to her being overweight.

Participants next answered two questions about the scenario. Specifically, participants were asked "How does the bullying make Anna feel?" and "How does Roger make Anna feel?" Both questions were assessed using the Faces Pain Scale—Revised scale used in Study 1. We combined these two items to form a single scale ($\alpha = .87$).

Finally, all participants were asked to evaluate their experience of playing Cyberball with the following question: "How would you describe your experience playing the Cyberball game?" The question was assessed on a 50-point scale with the following three scale labels: −25 (*extremely negative*), 0 (*neither negative nor positive*), and 25 (*extremely positive*). This question was designed as a manipulation check.

Results and Discussion

Manipulation check. The manipulation was successful. Participants in the exclusion condition had a less favorable experience playing Cyberball ($M = -2.48$, $SD = 3.07$) compared with participants in the inclusion condition ($M = 3.11$, $SD = 2.59$), $F(1, 50) = 49.51$, $p = .001$, $\eta^2 = .50$. Participants in the negative feedback condition also had a less favorable experience playing Cyberball ($M = -1.26$, $SD = 2.71$) compared with participants in the inclusion condition ($M = 3.11$, $SD = 2.59$), $F(1, 48) = 33.17$, $p = .001$, $\eta^2 = .41$, suggesting that the feedback they received was indeed negative. But participants in the exclusion and negative feedback conditions did not significantly differ in their ratings of the Cyberball task.

Primary analysis. We predicted that participants in the exclusion condition would judge the social exclusion scenario to be more painful compared with participants in both the inclusion and the negative feedback conditions. As predicted, participants in the exclusion condition estimated the bullying to be more severe ($M = 5.48$, $SD = 1.40$) than did participants in the inclusion condition ($M = 4.28$, $SD = 1.56$) $F(1, 50) = 8.23$, $p = .006$, $\eta^2 = .14$, and participants in the negative feedback condition ($M = 4.69$, $SD = 1.03$) $F(1, 47) = 4.83$, $p = .03$, $\eta^2 = .09$.

Taken together, Studies 1 and 2 provide initial support for our prediction of empathy gaps for social pain. In Study 1, we found that those who were actively experiencing social pain (i.e., exclusion condition) rated socially distressing events (but not other negative events) to be more painful compared with people who were not actively experiencing social pain (i.e., an inclusion and control condition). In Study 2, we found that general negative feedback did not heighten estimates of social pain. Only actively experiencing social pain seems to heighten people's understanding of social suffering.

Study 3

In Studies 1 and 2, we observed a relative difference in how participants in the exclusion and nonexclusion conditions evaluated the severity of social pain. Although consistent with the empathy gap for social pain hypothesis, this finding does not establish whether the nonexcluded participants objectively underestimated the severity of social pain. After all, it could be that the excluded participants overestimated the severity of the socially painful events—although this interpretation would run against the empathy gaps for physical pain literature. Thus our primary aim in Studies 3 and 4 was to establish an objective measure of social pain to determine whether nonexcluded participants objectively underestimated the pain of social suffering.

To do this, we brought participants into the lab in pairs and randomly assigned them to the actor or observer condition. Participants in the actor condition completed the social exclusion Cyberball manipulation used in Study 1 and then reported the severity of pain they experienced while playing Cyberball. Participants in the observer condition watched the actors play Cyberball but did not participate in the game themselves. Immediately after the game, they estimated the severity of pain their partner experienced while playing Cyberball.

Crucially, half of the observers were told they were on the same team as the actor they were paired with (high-identification con-

dition), whereas the other half of the observers were told they were on their own team (low-identification condition). This was done to manipulate the degree of (vicarious) social pain the observers would experience while watching Cyberball. We predicted that the low-identification observers would experience little social pain while watching their partner be ostracized and would therefore underestimate the pain their partner experienced. However, we predicted that the high-identification observers would experience social pain while watching their partner be ostracized and would therefore provide a more accurate assessment of their partner's pain.

Method

Participants. Ninety students (53 women and 37 men) from a Dutch university participated for course credit. Participants were brought into the lab in pairs and were randomly assigned to the actor or observer condition (creating 45 dyads). Pairs were both same and mixed sex. All pairs were composed of strangers.

Procedure. All actors were excluded during the Cyberball manipulation. The two computer-controlled Cyberball characters were labeled *green team* and *red team*, and the actor's character was labeled *blue team*.

Observers sat next to the actors and watched their partner play Cyberball. Observers were randomly assigned to the high- or low-identification condition. High identifiers were told that

> you and your partner are on the blue team. Your partner is going to play the first round of Cyberball. You cannot give your partner any suggestions during the game, but watch closely because you will play the next round.

Low identifiers were told that

> your partner is playing on the blue team. She or he will play first. You are on the yellow team. You cannot give your partner any suggestions during the game, but watch closely because you will play the next round.

One of our concerns was that high identifiers might communicate with their partner more than low identifiers would, which could provide an alternate explanation for differences in accuracy for estimated pain. We therefore instructed both actors and observers to not communicate with each other during the experimental session.

After the Cyberball task was completed, actors indicated how much pain they experienced while playing Cyberball. Observers made two pain ratings. First, they estimated how much pain they thought their partner experienced while playing Cyberball. Second, they indicated how much pain they themselves experienced while watching their partner play Cyberball. This latter question was used as a manipulation check to determine whether high-identification observers experienced more (vicarious) social pain than did low-identification observers. All judgments were made on the Faces Pain Scale—Revised used in Studies 1 and 2 (Bieri et al., 1990).

Results and Discussion

Manipulation check. The identification manipulation was successful. Observers in the low-identification condition (M = 1.96, SD = 0.76) experienced less social pain while watching their partner play Cyberball compared with observers in the high-identification condition (M = 2.64, SD = 0.95), $F(1, 43) = 6.97$, $p = .01$, $\eta^2 = .14$.

Primary analyses. We conducted a repeated-measures ANOVA with the actor's pain rating and the observer's pain estimate as the within-dyad variables and observer identification (high vs. low) as the between-subjects variable. We found the predicted interaction between actor and observer correspondence and the observer's level of identification, $F(1, 43) = 4.84$, $p = .03$, $\eta^2 = .10$ (see Figure 1). As predicted, low-identification observers (M = 2.86, SD = 1.05) significantly underestimated the severity of pain their partner experienced (M = 3.95, SD = 1.39), $t(22) = 3.78$, $p = .001$. However, high-identification observers had more accurate perceptions, as their pain estimates (M = 3.54, SD = 1.01) did not differ from their partners' pain ratings (M = 3.81, SD = 1.40), $t(21) = 1.18$, *ns*.

Study 4

Study 3 provides evidence for an *interpersonal* empathy gap for social pain: People who were not actively experiencing social pain underappreciated the severity of another's suffering. In Study 4, we examined whether people would exhibit empathy gaps when recalling a time when they themselves were socially excluded—an *intrapersonal* empathy gap for social pain. As such, Study 4 provided a more conservative test of the empathy gap for social pain hypothesis—as it deals with one's own behavior—and allows for a more precise measure of the accuracy of people's estimates of social pain.

Participants completed the Cyberball task following the procedure used in Study 1. Immediately afterward, participants assessed their experience playing Cyberball. One week later, participants were asked to recall their reaction to the Cyberball task. On the basis of the empathy gap finding that people need to actively experience visceral states to appreciate their motivational force, we predicted that participants who were initially excluded would, 1 week later, underestimate the severity of their reaction to the Cyberball task experienced a week earlier.

Method

Participants. Fifty-three students (29 women and 24 men) from a Dutch university completed the Time 1 questionnaire. Seven participants failed to attend their Time 2 appointment and

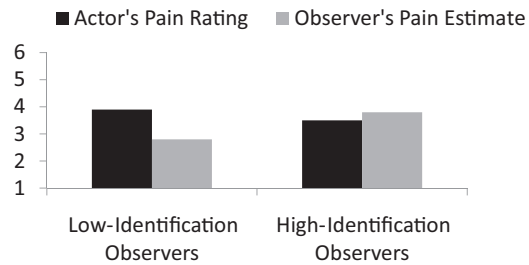

Figure 1. Study 3: Correspondence between actors' pain rating and observers' pain estimate by condition (low-identification observers and high-identification observers).

were dropped from the study. All analyses focus on the 46 participants who completed both sessions.

Procedure. Participants were randomly assigned to either the inclusion or the exclusion condition. After completing the Cyberball task, participants provided a general evaluation of the Cyberball task and indicated how the Cyberball task affected their mood. One week later, participants were asked to recall their reaction to the Cyberball task using the same general evaluation and mood items. The Time 1 and Time 2 questionnaires were nearly identical. The only difference was that at Time 2, participants were given the following instructions: "One week ago you played the Cyberball game. Try to remember what your experience was like playing Cyberball. When answering the questions, please try to imagine what you felt like right after the game ended."

Because we could not reveal the nature of the study until after participants completed the second session, participants were not fully debriefed about Cyberball during the first session. Instead, each participant received positive social feedback at the end of the first session in an effort to repair any feelings of exclusion. Specifically, participants were asked to create a personality profile that listed their cultural preferences (preferred movies, music, food, etc.). Participants were then asked to evaluate four other student profiles and rank order the profiles from most to least likeable. Finally, participants received feedback that their profile was ranked most likeable by the other four students.

General evaluation. Participants evaluated the Cyberball task with one item that asked, "How would you describe your experience playing the Cyberball game?" The question was assessed on a 50-point scale with the following three scale labels: −25 (*extremely negative*), 0 (*neither negative or positive*), and 25 (*extremely positive*).

Mood. Mood was measured with two items that asked participants to indicate how Cyberball affected their mood ($\alpha = .77$). The first mood item assessed how "the Cyberball game made me feel" on a scale from −25 (*very bad*), to 0 (*neither bad nor good*), to 25 (*very good*). The second mood item assessed how "the Cyberball game made me feel" on a scale from −25 (*very negative*), to 0 (*neither negative nor positive*), to 25 (*very positive*).

Results and Discussion

Manipulation check. We used the initial reactions to the Cyberball task as a manipulation check. The manipulation was successful. Participants in the exclusion condition evaluated the Cyberball task more negatively ($M = -3.60$, $SD = 2.49$) compared with participants in the inclusion condition ($M = 3.34$, $SD = 4.27$), $F(1, 44) = 45.49$, $p = .001$, $\eta^2 = .50$. Likewise, participants in the exclusion condition indicated that the Cyberball task more negatively impacted their mood ($M = -6.97$, $SD = 4.46$) compared with participants in the inclusion condition ($M = 1.82$, $SD = 3.15$), $F(1, 44) = 59.74$, $p = .001$, $\eta^2 = .57$.

Primary analysis. We conducted a series of repeated-measures ANOVAs to test our predicted Condition (exclusion, inclusion) × Time (Time 1, Time 2) interaction.

General evaluation. In line with our predictions, we found a Condition × Time interaction for the evaluation of the Cyberball task, $F(1, 44) = 12.80$, $p = .001$, $\eta^2 = .22$. One week after playing Cyberball, participants in the inclusion condition accurately recalled their initial evaluation of the Cyberball task, as their recalled evaluation ($M = 3.00$, $SD = 3.54$) did not differ from their initial evaluation ($M = 3.34$, $SD = 4.27$), $t(22) = 0.97$, *ns*. However, one week after playing Cyberball, participants in the exclusion condition did not accurately recall their initial evaluation. As predicted, participants' recalled evaluation ($M = -2.15$, $SD = 2.17$) underestimated the negativity of their initial evaluation ($M = -3.60$, $SD = 2.50$), $t(22) = -4.22$, $p = 001$.

Mood. A similar pattern emerged for participants' perceptions of how Cyberball affected their mood, $F(1, 44) = 12.95$, $p = .001$, $\eta^2 = .23$. One week after playing Cyberball, participants in the inclusion condition accurately recalled how Cyberball affected their mood, as their recalled mood assessment ($M = 1.71$, $SD = 2.40$) did not differ from their initial assessment ($M = 1.82$, $SD = 3.15$), $t(22) = 1.91$, *ns*. But 1 week after playing Cyberball, participants in the exclusion condition did not accurately recall their initial evaluation. Their recalled mood assessment ($M = -4.06$, $SD = 2.89$) underestimated the negativity of their mood immediately following Cyberball ($M = -6.98$, $SD = 4.46$), $t(22) = -4.73$, $p = 001$ (see Figure 2).

Thus, in line with the empathy gap finding that people need to actively experience pain to appreciate its motivational force, we found that participants who were initially excluded had difficulty appreciating the severity of social pain experienced in the Cyberball task just 1 week later. Study 4 thus replicates our early finding that people who are not experiencing social pain objectively underestimate its severity. Moreover, it provides some indication of the strength of this effect. That people continue to underestimate the severity of painful events they have already experienced suggests that empathy gaps for social pain are quite robust.

Study 5

The first four studies provided evidence for the hypothesis that people generally underestimate the severity of social pain. Beliefs about social pain are important because they strongly influence people's reaction to socially painful events and guide their approach to the many decisions and policies that address socially painful experiences. Study 5 tests this idea with a sample of people who regularly deal with situations involving social pain: middle-school teachers. After randomly assigning a group of middle-school teachers to inclusion, exclusion, or control conditions, we asked them to evaluate a scenario involving emotional bullying (ostracism, hurtful teasing, name calling, etc.) at school. Teachers estimated the severity of bullying and determined the appropriate punishment for bullies as well as the appropriate treatment for bullied students.

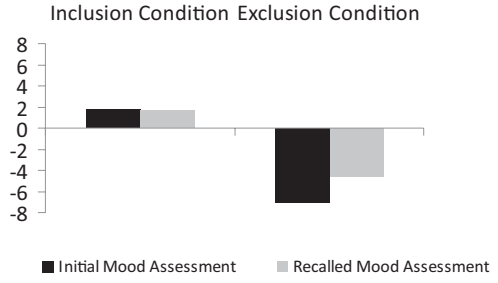

Figure 2. Study 4: Correspondence between initial and recalled mood assessment by condition (inclusion and exclusion).

We predicted that teachers who experienced social exclusion for themselves would have a heightened perception of the pain of emotional bullying—a heightened perception that would lead to more stern punishment for students who bully and more comprehensive treatment for bullied students. In other words, we expected that the perceived pain of emotional bullying would mediate the effect of condition on both punishment and treatment recommendations.

Method

Participants. Sixty-seven Dutch middle school teachers (40 women and 27 men) participated in exchange for money (€8, approximately $10.25). Teachers were recruited at a teaching convention.

Procedure. Participants were randomly assigned to the exclusion, inclusion, or control condition. As in the previous studies, the Cyberball task was used to manipulate exclusion and inclusion. Individuals in the control condition did not participate in the Cyberball task. After completing the Cyberball task, participants were asked to read the following scenario:

> Anna is one of the least popular girls in school. She has little contact with her classmates. When they do interact, they often tease her for being overweight and wearing unfashionable clothes. Roger teases her more than any other classmate. For example, when Anna walks to the front of the class, Roger will yell, "Earthquake!" in reference to her being overweight.

Participants next answered three sets of questions about the scenario. First, participants were asked two questions that addressed how the emotional bullying makes Anna feel: "How does the bullying make Anna feel?" and "How does Roger make Anna feel?" Both questions were assessed using the Faces Pain Scale—Revised scale used in Study 1.

Second, participants were asked to consider the correct punishment Roger should receive for bullying Anna. Participants were told,

> Take a moment to consider the range of punishments you use at your school. We would like to know what level of punishment you think is appropriate for students who bully. In particular, what punishment should Roger receive for bullying Anna?

Participants then rated Roger's appropriate punishment on a scale from 1 (*no punishment*) to 7 (*the school's maximum punishment*).

Third, participants were asked to indicate the extent of treatment that would be appropriate for bullied students. Participants indicated whether "it is the duty of the school to provide free counseling for Anna and other students who are bullied" and "Anna's teacher should encourage her to speak with a counselor to help her cope with the bullying" on a scale from 1 (*completely disagree*) to 7 (*completely agree*).

Finally, participants in the exclusion and inclusion conditions were asked to evaluate their experience playing Cyberball with the following question: "How would you describe your experience playing the Cyberball game?" The question was assessed on a 50-point scale with the following three scale labels: −25 (*extremely negative*), 0 (*neither negative nor positive*), and 25 (*extremely positive*). This question was designed as a manipulation check.

Results and Discussion

Manipulation check. The manipulation was successful. Participants in the exclusion condition had a less favorable experience playing Cyberball ($M = -3.63$, $SD = 3.40$) compared with participants in the inclusion condition ($M = 3.69$, $SD = 3.36$), $F(1, 43) = 52.83$, $p = .001$, $\eta^2 = .55$.

Primary analysis. We first examined participants' estimation of the severity of emotional bullying. As predicted, participants in the exclusion condition estimated the bullying to be more severe ($M = 6.31$, $SD = 1.66$) compared with both participants in the inclusion condition ($M = 5.43$, $SD = 1.33$), $F(1, 43) = 3.43$, $p = .05$, $\eta^2 = .08$, and participants the control condition ($M = 5.25$, $SD = 1.49$), $F(1, 42) = 5.01$, $p = .03$, $\eta^2 = .11$.

We next examined whether the heightened estimate of social pain observed in the exclusion condition would lead to more stern punishment for bullying and more comprehensive treatment for bullied students. As expected, participants in the exclusion condition recommended a more punitive punishment for classmates that bullied Anna ($M = 4.81$, $SD = 1.36$) compared with both participants in the inclusion condition ($M = 3.82$, $SD = 1.49$), $F(1, 43) = 5.37$, $p = .03$, $\eta^2 = .11$, and participants in the control condition ($M = 3.86$, $SD = 1.42$), $F(1, 42) = 5.14$, $p = .03$, $\eta^2 = .10$. Likewise, participants in the exclusion condition recommended more comprehensive treatment for Anna ($M = 4.75$, $SD = 1.00$) compared with both participants in the inclusion condition ($M = 4.02$, $SD = 0.90$), $F(1, 43) = 6.64$, $p = .01$, $\eta^2 = .13$, and participants in the control condition ($M = 3.95$, $SD = 1.22$), $F(1, 42) = 5.59$, $p = .02$, $\eta^2 = .11$.

Mediational analyses. Last, we examined whether the estimated severity of emotional bullying mediates the observed effect of condition assignment (exclusion, inclusion, and control) on both punishment and treatment recommendations (Baron & Kenny, 1986). First, we found a significant relationship between condition assignment and the outcome variables, punishment ($\beta = .47$, $p = .03$) and treatment recommendations ($\beta = .39$, $p = 02$). Second, we found a significant relationship between condition assignment and the mediating variable, perceived severity of emotional bullying ($\beta = .53$, $p = .02$). Third, the relationship between condition assignment and punishment recommendation diminished when the perceived severity of emotional bullying (the mediator) was included in the regression ($\beta = .23$, $p = .25$) (Sobel test, $z = 2.13$, $p = .03$). Likewise, the relationship between condition assignment and treatment recommendation diminished when severity of emotional bullying (the mediator) was included in the regression ($\beta = .24$, $p = .11$; Sobel test, $z = 2.08$, $p = .04$).

General Discussion

Although knowledge regarding the experience and consequence of social pain is growing rapidly, very little is known about people's beliefs about social pain. In this article, we put forward the hypothesis that people have a systematically distorted understanding of social pain. By joining the literature on the empathy gap for physical pain (Loewenstein, 1996) with social pain theory (Eisenberger & Lieberman, 2004; MacDonald & Leary, 2005; Panksepp, 1998), we generated the prediction that people need to actively experience social pain to fully appreciate its severity.

The findings support our hypothesis. In Study 1, we found that those who were actively experiencing social pain (i.e., in the

exclusion condition) rated a socially distressing event (but not other negative events) to be more painful compared with people who were not actively experiencing social pain (i.e., in the inclusion and control conditions). In Study 2, we found that general negative feedback did not heighten estimates of social pain. Only actively experiencing social pain seemed to heighten participants' understanding of social suffering.

In Study 3, we measured the objective accuracy of people's perception of social pain. In a dyad study, we found that observers underestimated their partners' social pain unless the observers experienced social pain for themselves. In Study 4, we examined whether people would exhibit empathy gaps when recalling a time when they themselves were socially excluded—an intrapersonal empathy gap for social pain. To do this, we had participants evaluate their reaction to a social exclusion task immediately following the task and then again 1 week later. Although the social exclusion task negatively impacted the participants, participants had difficulty appreciating the full severity of that initial experience 1 week later.

Beliefs about social pain are important because they strongly influence reactions to socially painful events. In Study 5, we examined one context in which this distorted judgment has important consequences: emotional bullying at school. We asked middle school teachers to evaluate a vignette involving such bullying. We found that actively experiencing social pain heightened the perceived pain of emotional bullying. The heightened perceptions of social pain, in turn, led teachers to advocate more comprehensive treatment for bullied students and recommend greater punishment for students who bully.

We believe that the tendency to underestimate the severity of social pain has numerous implications beyond school bullying. For example, the distorted judgments of social pain may interfere with the resolution of conflicts in interpersonal relationships. Our findings suggest that people may inadequately empathize with those who are coping with social pain. Along these lines, we are currently examining how the underestimation of social pain impacts company policy for issues like bereavement leave and employee victimization.

Although we believe that the misappraisal of social pain has many negative consequences, it may carry some benefits. An inability to appreciate the full emotional consequences of social pain may be an important facilitator of potentially risky social approach behaviors such as asking for a first date or leaving home for college. Indeed, an empathy gap for one's past social pain may be crucial in recovering from traumatic interpersonal events.

One limitation of the current work is that all five studies manipulated social exclusion using the Cyberball paradigm. Whereas some exclusion manipulations have been shown to lead to physical and emotional numbness (e.g., the future alone manipulation; DeWall & Baumeister, 2006), multiple studies have found no evidence for a hypoalgesic effect of Cyberball (Eisenberger & Lieberman, 2004; MacDonald, 2008). It is thus unclear to what extent the empathy gap findings would hold for exclusion experiences that lead to emotional numbness.

Although the current work suggests that individuals not experiencing social pain have difficulty appreciating social suffering, a related question is whether individuals experiencing social pain have an empathy gap for feeling included. If excluded individuals underestimate the relief that would come from pursuing opportunities for connection, this form of empathy gap may decrease motivation for social behaviors likely to ameliorate feelings of social pain. Indeed, excluded individuals appear to engage in antisocial behaviors (e.g., Twenge et al., 2001) and fail to engage in prosocial behaviors (e.g., Twenge, Baumeister, DeWall, Ciarocco, & Bartels, 2007), in a manner that may interfere with the pursuit of inclusion. Further, hurt individuals who have trouble appreciating what sorts of decisions they may make when the pain passes, or even those who have trouble appreciating that it is possible to feel something other than hurt, might be prone to self-harming behaviors like suicide.

Future research aimed at improving public policy should consider ways to correct the distorted judgments of social pain. Perhaps researchers can best begin by looking at how people have tried to overcome biased judgments of physical pain. The most common approach has been to recognize the bias and try to correct for it. The realization that physicians tend to underestimate the severity of pain has shifted the guidelines for the administration of anesthetic for a variety of medical procedures (Rupp & Delaney, 2004). A related solution has been for physicians to acknowledge that patients have a better understanding of their own pain than physicians can and thus prescribe anesthetic on the basis of the patient's report of pain intensity (Decosterd et al., 2007). Finally, in a few cases, obstetricians are trying to correct expecting mothers' perceptions of labor pain by allowing them to feel physical pain (by putting their arm in ice water) before deciding to forgo anesthetic during labor.

Each of these approaches might be useful for correcting the biased judgments of social pain. For example, schools might acknowledge this bias and adjust their policies accordingly (e.g., offering more counseling for emotionally bullied students). Or companies might design a bereavement leave policy that reflects the judgment of the grieving employee, as opposed to the judgment of a human resource manager. A final approach might be to self-induce mild states of social pain as a way to improve understanding of other's pain. It is encouraging that a recent study found that people seem to have some capacity to self-induce the feeling of social pain by relieving past socially distressing events (Chen, Williams, Fitness, & Newton, 2008). The findings by Chen et al. (2008) suggest that when the need for empathetic accuracy is high, people might try to self-induce feelings of social pain to better appreciate the pain of others.

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