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Feeling Close: Emotional Intensity Reduces Perceived Psychological Distance

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The results of 6 experiments indicate that emotional intensity reduces perceived psychological distance. People who described events emotionally rather than neutrally perceived those events as less psychologically distant, including embarrassing autobiographical events (Experiment 1), past and future dentist visits (Experiment 2), positive and negative events (Experiment 3), and a national tragedy (Experiment 6). People also perceived an event (dancing in front of an audience) as less psychologically distant when they were in a more emotionally arousing social role (of performer) than in a less emotionally arousing social role (of observer; Experiment 4). Two findings bolster the causal role of emotional intensity in reducing perceived psychological distance. First, reported emotional intensity was negatively correlated with perceived psychological distance and statistically mediated the effect of being in an emotionally arousing social role on perceived psychological distance (Experiment 4). Second, providing people with an alternative interpretation of their emotions (emotionally ambiguous whale songs) significantly reduced, even reversed, the negative correlation between self-reported emotional intensity and perceived psychological distance (Experiment 5). These findings about emotional intensity are consistent with the broader idea that perceived psychological distance is grounded in and influenced by the phenomenology of objective distance. Implications for theories of psychological distance, emotionality, and choice are discussed.

Keywords: emotion, intensity, judgment, psychological distance, subjective time

> It is important to realize that the psychological past and the psychological future are simultaneous parts of the psychological field existing at a given time *t*. The time perspective is continually changing. (Kurt Lewin, 1951, p. 208, defining the "field at a given time")

What makes things seem of greater or less psychological distance? What makes high school graduation sometimes seem like just yesterday and other times like long ago? What makes upcoming public presentations seem just around the corner or ages away? Both past graduations and future presentations are not directly experienced and are therefore psychologically distant compared with the immediate present (Liberman & Trope, 2008). Graduations and presentations can nevertheless vary in how psychologically distant they seem. Understanding what makes events seem of greater or lesser psychological distance is important because perceived psychological distance constitutes psychological reality, as Lewin's (1951) oft-cited observation makes clear. As Lewin's observation also makes clear, psychological distance, time perspective, continually changes. What changes time perspective?

We hypothesize that emotional intensity influences time perspective, reducing perceived psychological distance. That is, people perceive events of equal objective distance as less psychologically distant when people feel more rather than less intense emotions about those events. The hypothesis that emotional intensity reduces perceived psychological distance is consistent with the more general idea that perceived psychological distance is grounded in and influenced by the phenomenology that is typically associated with objective distance.

Psychological Distance

Psychological distance is foundational to psychological science. Early theories of psychological conflict emphasized the role of psychological distance in approach and avoidance gradients, with motivation and goal conflict generally increasing as psychological distance decreased (Miller, 1944). The notion of psychological distance also figured prominently in Lewin's (1951) field theory, where the number of regions between important objects—goals, people, pasts, and futures—constituted psychological distance in people's life space.

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Psychological distance is also a central construct in the psychology of temporal dynamics. Researchers have argued, for instance, that psychological distance increases confidence (Gilovich, Kerr, & Medvec, 1993), the tendency to severely judge morally questionable actions (Eyal, Liberman, & Trope, 2008), motivation to complete tasks (Sanna, Parks, Chang, & Carter, 2005), the tendency to broadly categorize both the self (Wakslak, Nussbaum, Liberman, & Trope, 2008) and external objects (Liberman, Sagristano, & Trope, 2002), and the tendency to make decisions based on central rather than peripheral features (Liberman & Trope, 1998). In these (and many other) studies, however, psychological distance has been confounded with objective distance: for example, weeks until an exam (Gilovich et al., 1993), days or months until morally questionable acts (Eyal et al., 2008), days until a deadline (Sanna et al., 2005), weeks or years until a future self (Wakslak et al., 2008), months until a camping trip (Liberman et al., 2002), and months until a decision (Liberman & Trope, 1998). Although objective distance and psychological distance are undoubtedly associated, operationalizing psychological distance as objective distance makes it impossible to ascertain whether psychological distance influences people's thoughts, feelings, and behavior independent of objective distance.

Recent studies have clarified the independent role of perceived psychological distance. For future events, people are happier and more attentive to momentary pleasures when they are led to perceive a life transition (e.g., college graduation) as less psychologically distant (Kurtz, 2008). Also, perceived psychological distance to future outcomes is correlated with people's valuation of those outcomes independent of those outcomes' objective distance (Zauberman, Kim, Malkoc, & Bettman, 2009). For past events, people are less motivated to favorably appraise past selves when they perceive those selves as more psychologically distant, independent of past selves' objective distance (Wilson & Ross, 2001). Inviting people to perceive a past event as more psychologically distant leads people to believe that they have experienced more personal change since that event (Eibach, Libby, & Gilovich, 2003), and people are more forgiving of past interpersonal transgressions when they perceive those transgressions as more psychologically distant (Wohl & McGrath, 2007).

Although recent studies have clarified the independent importance of perceived psychological distance, those studies have provided little evidence about what influences perceived psychological distance because they directly manipulated perceived psychological distance (e.g., by asking people to think of past event as being in the "recent past" or "way back then"; Wilson & Ross, 2001). The ambiguity is unfortunate because people's psychological reality—their life space (Lewin, 1951)—is grounded in perceived psychological distance. What, then, influences perceived psychological distance?

We contend that perceived psychological distance is grounded in, and hence influenced by, the phenomenology that is typically associated with objective distance. The perception of psychological distance, that is, is influenced by the *qualia*—the set of introspectively accessible subjective experiences (Jackson, 1982; Lewis, 1929; Ramachandran & Hirstein, 1997)—of objective distance. The constellation of experiences that are typically associated with reduced objective distance should therefore reduce perceived psychological distance. Our central hypothesis is derived from this phenomenological definition of perceived psychological distance: Emotional intensity reduces perceived psychological distance.

Cognitive Experience and Psychological Distance

Before elaborating the hypothesis that emotional intensity reduces perceived psychological distance, it is worth considering how the phenomenological definition is consistent with theories that emphasize the association between objective distance and cognitive experiences. Specifically, the phenomenological definition is consistent with the possibility that nonemotional cognitive experiences influence perceived psychological distance, including simple perceptual experiences and higher order mental representations. Perceptual fluency and visual perspective, for example, may influence perceived psychological distance, although such perceptions have not been explicitly measured in studies of fluency and visual perspective. Perceptual fluency, the ease with which people think about events, may influence perceived psychological distance because people perceive close, familiar events more fluently than they perceive distant, unfamiliar events (Alter & Oppenheimer, 2008; Unkelbach, 2006). The visual perspective people adopt when recalling events may influence perceive psychological distance because people are more likely to recall distant rather than recent events from a third-person perspective, as an observer looking in on the self, rather than from a first-person perspective (Frank & Gilovich, 1989; Nigro & Neisser, 1983; Robinson & Swanson, 1993). People are also more likely to believe that they have changed to the degree that they recall events from a third-person perspective (Libby & Eibach, 2002), and perceptions of personal change are associated with perceived psychological distance (Eibach et al., 2003).

Regarding higher order mental representations, construal level theory implies that people tend to represent objectively distant events more abstractly than objectively close events, which are represented more concretely in terms of specific details (Liberman & Trope, 2008; Trope & Liberman, 2003). For example, distant objects are categorized more broadly (Liberman & Trope, 1998), distant people are perceived more dispositionally (Nussbaum, Trope, & Liberman, 2003), and distant activities are interpreted more in terms of desirability than feasibility (Liberman & Trope, 1998)—mental representations that correspond with more abstract construals of objects, people, and activities. The relationship between construal level and objective distance is bidirectional such that concretely construed events tend to be perceived as objectively closer than abstractly construed events (Liberman, Trope, McCrea, & Sherman, 2007). Construal level theory might therefore imply that increased concreteness reduces perceived psychological distance, although those studies have not explicitly measured perceived psychological distance.

Emotional Intensity and Psychological Distance

We hypothesize that emotional intensity reduces perceived psychological distance and that this effect is independent of fluency, visual perspective, and other nonemotional experiences such as construal level. This hypothesis follows from the fact that increased emotional intensity is naturally associated with reduced objective distance: Events that are objectively closer are typically more emotionally intense (Frijda, 1988, 1992). Because emotions

serve, at least somewhat, to functionally direct behavior (Keltner & Gross, 1999; Lazarus, 1991), people typically feel more intense when events are objectively close than objectively distant (Loewenstein, 1996; Metcalfe & Mischel, 1999). If the phenomenology associated with objective distance influences perceived psychological distance, the natural association between emotional intensity and objective distance implies that when people feel emotionally intense about an event, they should perceive that event as less psychologically distant compared with when people feel less intense about that event. Next month's public presentation, for example, might seem psychologically close when it arouses anxiety and excitement, independent of how easily the presentation is imagined, of the visual perspective adopted when imagining the presentation, and of how concretely the presentation is construed.

The hypothesis that emotional intensity reduces perceived psychological distance is consistent with at least two sets of findings. First, the intensity of reactions to contemplating past emotional events is reduced by directing people to adopt a self-distanced perspective (e.g., "watch the experience unfold as if it were happening . . . to the distant you") rather than a self-immersed perspective (e.g. "relive the situation as if it were happening to you all over again"; Ayduk & Kross, 2008; Kross & Ayduk, 2008; Kross, Ayduk, & Mischel, 2005). Although studies of self-distancing have not explicitly measured perceived psychological distance, it is plausible that adopting a self-distanced perspective reduced emotional intensity at least partly because it increased perceived psychological distance. It is also plausible, of course, that self-distancing reduces emotional intensity for reasons other than perceived psychological distance, such as reinterpreting events' meaning or suppressing emotional reactions. The fact that increasing psychological distance decreases emotional intensity does not imply that increasing emotional intensity decreases perceived psychological distance.

Second, we conducted two pilot studies suggesting that emotional intensity is central to people's intuitive definitions of psychological distance. When we asked 28 university students at the University of Colorado at Boulder, "What does it mean to say that an event is 'close' versus 'far away'?", most (75%, 95% CI [56%, 87%]) mentioned emotional intensity, answering, for example, "it is a feeling" and "it means that emotionally we feel disconnected or connected . . . . it is almost a meter of our emotions."[1] Similarly, when, on the seventh anniversary of the September 11 terror attacks, we asked 26 university undergraduates at the University of Colorado at Boulder what made the terrorist attacks seem psychologically close or distant, a substantial fraction, approximately half (54%, 95% CI [35%, 71%]), mentioned emotional intensity, for example, "it still upsets me very much and therefore feels like it could have been yesterday." These findings suggest that people intuitively define psychological distance in terms of the phenomenology associated with objective distance—emotional intensity, in particular. Increasing emotional intensity should therefore reduce perceived psychological distance.

Overview of the Present Experiments

In six experiments, we tested the hypothesis that emotional intensity reduces perceived psychological distance. We measured perceived psychological distance after experimentally manipulating whether people described various events emotionally or neutrally: embarrassing moments (Experiment 1), past and future dentist visits (Experiment 2), positive and negative events (Experiment 3), and a national tragedy (Experiment 6). We also tested whether people would perceive an event (dancing in front of an audience) as less psychologically distant when randomly assigned to a highly emotional social role (performer) than to a less emotional role (observer; Experiment 4).

To more precisely examine emotional intensity's causal influence on perceived psychological distance, we tested whether reported emotional intensity would be negatively correlated with perceived psychological distance (Experiments 4 and 5). We also tested whether reported emotional intensity would statistically mediate the effect of being in a more or less emotionally arousing social role on perceived psychological distance (Experiment 4). Finally, we tested whether leading people to attribute their emotions to an alternative source would reduce the negative correlation between emotional intensity and perceived psychological distance (Experiment 5).

Experiment 1: Embarrassing Moments

We first sought to experimentally manipulate how intense people's emotions about an event were, independent of the event's objective distance. We asked people to think of an autobiographical embarrassing moment. We then asked people to describe the event either emotionally or neutrally. We predicted that people would perceive their embarrassing moment as less psychologically distant when described emotionally. We also examined the potential role of increased perceptual fluency by asking people to report how easily they recalled the embarrassing moment. We did not expect that emotional descriptions would be more perceptually fluent (i.e., easier to recall) than neutral descriptions or that the effect of emotionality on perceived psychological distance would be attributable to perceptual fluency.

Method

Forty university undergraduates at the University of Colorado at Boulder, participating in exchange for course credit, were asked to

[1] Two separate pairs of research assistants, masked to hypotheses, coded the descriptions in both surveys with substantial agreement (between 86% and 90%); a third research assistant resolved disagreements. Coders indicated attributes mentioned in the description. *Emotional intensity* was defined as "how much the description emphasizes how intensely—how weak or strong—a person feels about an event. Descriptions that feature emotional intensity are those implying that intensity of feeling is related in some way to psychological distance." In addition to emotionality, approximately half of respondents (47%, 95% CI [28%, 66%]), across the two pilot studies, were coded as mentioning construal level. *Construal level* was defined as "how much the description emphasizes 'low-level features' versus 'high-level' features. *Low-level features* are concrete details of an event. *High-level features* concern the broader significance of the event or its applications. Descriptions that feature construal level are those implying that whether an event is mentally represented concretely or abstractly is related in some way to psychological distance." That participants frequently mentioned both emotionality and construal level is consistent with the broader idea that perceived psychological distance is grounded in the phenomenology of objective distance, including both emotionality and construal level.

think of a specific embarrassing moment they had experienced since starting university. Participants were then asked to write a description of that moment in one of two ways, depending on random assignment.[2] Those in the emotional description condition were asked to describe the event "in an empathic manner . . . as though you were actually re-experiencing the event" such that "someone reading [the description] would feel embarrassed just by reading your description." These instructions were adapted from widely used emotion induction methods (e.g., Lerner & Keltner, 2001). Those in the neutral description condition were asked to describe the event "in a detached and unemotional manner . . . in terms of the objective facts, actions, and circumstances" but "in such a way that you don't feel anything at all."

After describing the event emotionally or neutrally, participants read that events "may feel very far away or very close, regardless of when they actually occurred." Participants then reported how psychologically distant they perceived the embarrassing moment to be on two 10-point scales (1 = *feels like yesterday,* 10 = *feels very far away*; 1 = *feels very close,* 10 = *feels very distant*; cf. Ross & Wilson, 2002) that we averaged into a single measure of perceived psychological distance ($r = .82$). To measure perceptual fluency, participants also reported how difficult or easy it was to recall the embarrassing moment (1 = *very difficult,* 10 = *very easy*). Participants were then thanked and debriefed.

Results and Discussion

As predicted, participants perceived their previous embarrassing moment to be less psychologically distant after describing it emotionally ($M = 4.90$, $SD = 2.30$) than after describing it neutrally ($M = 6.66$, $SD = 1.83$), $t(38) = 2.67$, $p < .025$ (see Table 1). These results provide initial evidence that emotional intensity reduces perceived psychological distance.

To examine whether emotionality manipulation might have reduced perceived psychological distance because it increased perceptual fluency, we conducted a multiple regression in which we estimated perceived psychological distance from emotionality (emotional description = 1, neutral description = −1) and fluency, as measured by reported ease of recall. The effects of both emotionality, $t(37) = 2.33$, $p < .05$, and fluency, partial $r = -.44$, $t(37) = 2.96$, $p < .01$, were significant, and the effect of emotionality was not significantly reduced when fluency was included in the model (Sobel $z = 1.07$, *ns*). Moreover, participants in the emotional description condition did not report significantly greater fluency ($M = 7.62$, $SD = 2.11$) than did participants in the neutral description condition ($M = 6.84$, $SD = 2.17$), $t(38) = 1.15$, *ns.* Although perceptual fluency (ease of recall) was associated with perceived psychological distance, the effect of manipulated emotionality on perceived psychological distance was not attributable to fluency.

Table 1
Participants' Perceived Psychological Distance to Events Described Emotionally or Neutrally in Experiments 1, 2, 3, and 6

Experiment	Description type: Neutral	Description type: Emotional
1: Embarrassing moments	6.66 (1.83)	4.90 (2.30)
2: Past and future dentist visits		
Past	6.39 (1.84)	5.11 (2.18)
Future	5.84 (2.09)	4.86 (2.51)
Overall	6.11 (1.96)	5.00 (2.28)
3: Positive and negative events		
Positive event	6.73 (1.73)	5.47 (2.23)
Negative event	5.11 (2.46)	3.87 (2.14)
Overall	6.02 (2.35)	4.57 (2.30)
6: Multidimensional distance to Virginia Tech		
Temporal	4.69 (2.52)	3.44 (1.95)
Spatial	4.44 (2.31)	3.33 (1.61)
Social	4.69 (2.27)	3.28 (2.02)
Overall	4.60 (1.89)	3.35 (1.56)

Note. Higher numbers indicate greater distance. Standard deviations are in parentheses.

We conduced a follow-up experiment to confirm that the description manipulation influenced emotional intensity. We asked 60 university undergraduates at the University of Colorado at Boulder to think of an embarrassing moment they had experienced since entering university and to describe that event in either an emotional or neutral manner, exactly as in the main experiment. Participants then reported how much (1 = *very slightly/not at all,* 5 = *very much*) they currently felt anxious, embarrassed, upset, nervous, scared, and distressed, which we averaged into an index of self-perceived emotional intensity ($\alpha = .83$). As expected, participants who wrote emotional descriptions reported more intense emotions ($M = 1.68$, $SD = 0.72$) than did participants who wrote neutral descriptions ($M = 1.32$, $SD = 0.36$), $t(58) = 2.38$, $p < .025$.[3] Writing emotional descriptions of embarrassing moments thus aroused more intense emotions than writing neutral descriptions of embarrassing moments.

We also included two additional measures in the follow-up experiment that afforded an examination of whether our experimental manipulation might also influence construal level and concreteness of mental representations. We asked participants to rate how much they thought about the embarrassing event using "low-level construals" that "typically pertain to the concrete details and consequences of an event . . . what you see and hear" relative to how much they thought about the embarrassing event using "high-level construals" that "typically pertain to the significance of an event—its broad applications, central meaning, and what it says about you" (1 = *low-level construal,* 7 = *high-level construal*). Participants did not report thinking about the emotionally described event at a significantly higher construal level ($M = 4.07$, $SD = 1.39$) than the neutrally described event ($M = 3.60$, $SD = 1.40$), $t(58) = 1.29$, *ns.* We also asked participants to report how much they mentally represented the event in terms of "specific details of *how* the embarrassing event happened relative to the broader meaning of *why* the embarrassing event happened" (1 = *specific details/how,* 7 = *broader meaning/why*). Participants did

[2] The number of words did not significantly differ by condition in any experiment.

[3] We conducted the follow-up manipulation check with a separate sample because we were concerned that asking people to explicitly report both constructs might undermine the effect of emotionality on perceived psychological distance (cf. Lerner & Keltner, 2001). This concern proved to be unfounded, as is made clear in Experiments 4 and 5.

not report thinking about the emotionally described event with significantly more specificity ($M = 3.33$, $SD = 1.56$) than the neutrally described event ($M = 3.13$, $SD = 1.55$; $t < 1$, *ns*). These findings cast doubt on the possibility that the effect of our emotionality manipulation on perceived psychological distance is attributable to construal level or mental representation specificity.

Experiment 2: Past and Future Dentist Visits

The primary goal of Experiment 2 was to extend to events in both the past and future the finding that emotional intensity reduces perceived psychological distance. Such an extension is important because it is possible that, in Experiment 1, emotional intensity reduced perceived psychological distance to past events because emotional intensity led people to relive the embarrassing event, which might have reduced perceived psychological distance (Ayduk & Kross, 2008; Kross & Ayduk, 2008; Kross et al., 2005). To the extent that reliving past experiences is linked to memory processes, such reliving should be less relevant to the perceived psychological distance to future events. In contrast, because emotional intensity is associated with events that are objectively close in both the past and future (Van Boven & Ashworth, 2007), our hypothesis implies that emotional intensity should reduce perceived psychological distance of both past and future events.

We therefore asked people to describe, either emotionally or neutrally, their last or their next dentist visit. We predicted that people would perceive emotionally described dentist visits as less psychologically distant than neutrally described dentist visits, independent of tense.

We also examined the potential role of visual perspective by asking people to report the degree to which they imagined the dentist visit from a first-person versus a third-person perspective (Nigro & Neisser, 1983; Robinson & Swanson, 1993). If describing events emotionally reduces perceived psychological distance because it engenders first-person perspectives, then emotional descriptions should influence visual perspective, which should statistically mediate the effect of emotionality on perceived psychological distance. Finally, we examined, as in Experiment 1, whether the effect of emotionality on perceived psychological distance might be attributable to perceptual fluency. We did not expect that manipulated emotionality would influence either visual perspective or fluency or that either visual perspective or fluency would statistically mediate the effect of emotionality on perceived psychological distance.

Method

Sixty-three university undergraduates at the University of Colorado at Boulder participating in exchange for course credit were asked to think about either their last or next dentist visit, depending on random assignment. Specifically, participants were either asked, "How long ago (in days, months, and years) did your last visit occur?" or "How long until (in days, months, and years) your next visit?" Participants were then instructed to describe the visit, depending on random assignment, in one of two ways. Those in the emotional description condition were told, "When describing the visit, try to do so in an involved and empathic manner . . . . Try to describe the visit such that someone reading it would feel the same way you did just by reading your description." Those in the neutral description condition were told, "When describing the visit, please try to do so in a detached and unemotional manner . . . try to think about the visit objectively, in terms of the objective facts, actions, and circumstances . . . in such a way that you don't feel anything at all." The instructions were identical for participants in both the past and future tense conditions.

Participants then reported the visit's perceived psychological distance on two scales (1 = *feels like* [yesterday/tomorrow], 9 = *feels very far away*; 1 = *feels very close,* 9 = *feels very distant*) that we averaged into an index of psychological distance ($r = .91$). To measure visual perspective, we included a measure based on previous research (Libby & Eibach, 2002):

> Sometimes we think about ("see") an event from a first-person perspective. In a first-person image you see the event from the same visual perspective that you would typically; in other words, you are looking out at your surroundings through your own eyes. At other times we "see" an event from a third-person perspective. In the third person, you see the event from an observer's visual perspective; in other words, you can actually see yourself, as well as your surroundings.

Participants then reported their visual perspective while contemplating the dentist visit (1 = *my own eyes,* 9 = *an observer's eyes*). Finally, as a measure of perceptual fluency, participants reported how easy it was for them to think about the dentist visit (1 = *very difficult,* 9 = *very easy*). Participants were then thanked and debriefed.

Results and Discussion

Participants reported that they had last visited the dentist a longer time ago ($M = 174.62$ days, $SD = 205.48$ days) compared with how soon they expected to next visit the dentist ($M = 81.50$ days, $SD = 52.97$ days), which may reflect participants' optimistic intentions about future dental hygiene. A 2 (emotionality: emotional description, neutral description) × 2 (tense: past, future) analysis of variance (ANOVA) on participants' estimated number of days until the visit revealed only a main effect of tense, $F(1, 57) = 4.59$, $p < .05$. Importantly, neither the main effect of emotionality, $F(1, 57) = 1.39$, *ns,* nor the interaction ($F < 1$) was significant.

As predicted, emotionally described dentist visits were perceived as less psychologically distant ($M = 5.00$, $SD = 2.28$) than neutrally described visits ($M = 6.11$, $SD = 1.96$; see Table 1). A 2 (emotionality: emotional description, neutral description) × 2 (tense: future, past) ANOVA on perceived psychological distance revealed only a main effect of emotionality, $F(1, 59) = 4.28$, $p < .05$. Neither the main effect of tense nor the interaction was significant (both Fs < 1). This finding conceptually replicates the finding that emotional intensity reduces perceived psychological distance, extending the pattern to both past and future events.

We next examined the association between visual perspective, emotionality, and perceived psychological distance. In a multiple regression, we estimated participants' perceived psychological distance from emotionality (emotional description = 1, neutral description = −1), tense (future = 1, past = −1), the interaction of emotionality and tense, and reported visual perspective. The effect of visual perspective was marginally significant, partial $r = .25$, $t(58) = 1.93$, $p = .06$, reflecting that participants tended to

perceive dentist visits as more psychologically distant to the degree they imagined visits as an observer. However, the effect of emotionality remained significant, $t(58) = 2.05$, $p < .05$, and was not significantly reduced when visual perspective was included in the model (Sobel $z < 1$). Neither the effect of tense nor the interaction between emotionality and tense was significant (both ts < 1.01). Moreover, none of the effects approached significance in a 2 (emotionality: emotional description, neutral description) $\times$ 2 (tense: past, future) ANOVA on visual perspective (all Fs < 1.1, *ns*). Although visual perspective was marginally associated with perceived psychological distance, the effect of manipulated emotionality on distance was not attributable to visual perspective.

Finally, we examined the association between perceptual fluency (ease of imagination), emotionality, and perceived psychological distance. In a multiple regression, we estimated participants' perceived psychological distance from emotionality, tense, the interaction between emotionality and tense, and fluency. The effect of fluency was significant, partial $r = -.28$, $t(58) = 2.23$, $p < .05$, indicating that participants perceived the dentist visit as less psychologically distant to the degree that they easily imagined the visit. However, the effect of emotionality remained significant, $t(58) = 1.98$, $p = .05$, and was not significantly reduced when fluency was included in the model (Sobel $z < 1$). Neither tense, $t(58) = 1.42$, *ns,* nor the interaction between emotionality and tense ($t < 1$) was significant. Moreover, in a 2 (emotionality: emotional description, neutral description) $\times$ 2 (tense: past, future) ANOVA on fluency, only tense was significant, $F(1, 59) = 6.63$, $p < .025$, reflecting that participants imagined a future dentist visit more easily ($M = 7.98$, $SD = 2.13$) than they imagined a past dentist visit ($M = 6.93$, $SD = 2.29$; cf. Kane, 2009; Van Boven & Ashworth, 2007; Van Boven, Kane, & McGraw, 2008). Although fluency was associated with perceived psychological distance, the effect of manipulated emotionality on psychological distance was not attributable to fluency.[4]

These results together conceptually replicate, with both past and future events, the tendency for emotional intensity to reduce perceived psychological distance. These results also provide additional, tentative evidence that cognitive experiences of perceptual fluency and visual perspective are associated with perceived psychological distance. Those cognitive experiences do not, however, explain the effect of manipulated emotional intensity on perceived psychological distance.

Experiment 3: Positive and Negative Events

We next sought to examine whether people's desire to be close to or distant from events would moderate the effect of emotionality on perceived psychological distance. Because people presumably prefer to be closer to positive events than to negative events and because emotional intensity generally makes people more concerned about events, it is possible that emotional intensity about positive events reduces perceived psychological distance more than emotional intensity about negative events. Indeed, research on temporal self-appraisal theory indicates that people perceive desirable past selves as less psychologically distant (reflecting favorably on the present self) and undesirable past selves as more psychologically distant (in an effort to reduce unfavorable reflections on the present self; Broemer, Grabowksi, Gebauer, Ermel, & Diehl, 2008; Ross & Wilson, 2002; Wilson & Ross, 2001).

The results of Experiments 1 and 2 cast doubt on such a motivational explanation as the primary reason why emotional intensity reduces perceived psychological distance. Because people presumably prefer to be more rather than less distant from embarrassing moments and dentist visits, a purely motivational explanation might imply that people would perceive emotionally arousing embarrassing moments and dentist visits to be more rather than less psychologically distant—exactly the opposite of our findings. Still, given previous research on self-appraisal concerns and the influence of motivational considerations on perceived psychological distance, we sought to directly test whether the tendency for emotional intensity to reduce perceived psychological distance would be stronger for positive events than for negative events.

We experimentally manipulated whether participants contemplated positive or negative future events. People described, either emotionally or neutrally, positive events they were looking forward to or negative events they were dreading, depending on random assignment. We predicted that people would perceive emotionally described events as less psychologically distant than neutrally described events, independent of events' valence. We also measured perceptual fluency. On the basis of the results of Experiments 1 and 2, we expected that fluency would be associated with perceived psychological distance but that manipulated emotionality would not affect fluency and that fluency would not statistically mediate the effect of emotionality on perceived psychological distance.

Method

Eighty-four university undergraduates at the University of Colorado at Boulder participating in exchange for course credit were asked to think of an event that would occur within the next 3 months that, depending on random assignment, they were looking forward to (a positive event) or dreading (a negative event). Participants identified the event, estimated the number of days until its occurrence, and then, depending on random assignment, were asked to describe the event either emotionally or neutrally, as in Experiments 1 and 2. Participants then reported psychological distance of the event on two scales (1 = *feels like tomorrow,* 9 = *feels very far away*; 1 = *feels very close,* 9 = *feels very distant*)

[4] Self-reported fluency and visual perspective were negatively correlated, although not significantly, such that people tended to imagine first-person perspectives more easily than third-person perspectives (partial $r = -.19$, $p = .15$), controlling for emotionality, tense, and their interaction. That fluency and visual perspective might be negatively correlated is not surprising given that first-person perspectives are more frequent, natural, and directly experienced than third-person perspectives (Nigro & Neisser, 1983; Robinson & Swanson, 1993). It is also not surprising, given the moderate negative correlation between two variables, that both fluency, $t(57) = 1.92$, $p = .06$, and visual perspective, $t(57) = 1.57$, $p = .12$, were marginally significant (although their effects were not significantly reduced; Sobel zs $= <1.25$, *ns*) in a regression estimating perceived psychological distance from fluency, visual perspective, emotionality, tense, and the interaction between emotionality and tense. Importantly, the effect of emotionality remained significant, $t(57) = 2.00$, $p = .05$. Given the overall pattern of results, our tentative conclusion, which obviously warrants further empirical scrutiny, is that both fluency and visual perspective are independently associated with perceived psychological distance.

that we averaged into a distance index ($r = .83$). As a measure of perceptual fluency, participants also reported how easy it was for them to think about the event (1 = *very difficult,* 9 = *very easy*). Participants were then thanked and debriefed.

Results and Discussion

Emotionally described events were perceived as less distant ($M = 4.57$, $SD = 2.30$) than neutrally described events ($M = 6.02$, $SD = 2.35$; see Table 1). A 2 (emotionality: emotional description, neutral description) × 2 (event valence: positive, negative) ANOVA revealed the expected main effect of emotionality, $F(1, 80) = 6.27$, $p < .025$. Participants also perceived negative events as less distant ($M = 4.57$, $SD = 2.38$) than positive events ($M = 6.02$, $SD = 2.09$), $F(1, 80) = 10.53$, $p < .005$. Although not anticipated, the effect of valence may simply reflect that negative events are more emotionally intense than positive events (e.g., Baumeister, Bratslavsky, & Finkenauer, 2001; Rozin & Royzman, 2001). Importantly, however, the interaction between emotionality and valence was not significant ($F < 1$).

To examine the role of perceptual fluency, we regressed participants' perceived psychological distance on emotionality (emotional description = 1, neutral description = −1), valence (positive = 1, negative = −1), the interaction of emotionality and valence, and fluency. The effect of fluency was significant, partial $r = -.29$, $t(79) = 2.70$, $p < .01$, indicating that participants perceived the event as less psychologically distant to the degree that they easily imagined the event. Importantly, the effects of emotionality, $t(79) = 2.99$, $p < .005$, and valence, $t(79) = 3.73$, $p < .001$, remained significant, and the effect of emotionality was not significantly reduced (Sobel $z = 1.24$, *ns*) with fluency in the model. Furthermore, a 2 (emotionality: emotional description, neutral description) × 2 (event valence: positive, negative) ANOVA on ease of imagination did not reveal significant effects of emotionality, $F(1, 80) = 1.40$, *ns*; valence, $F(1, 80) = 1.32$, *ns*; or their interaction ($F < 1$). As in Experiments 1 and 2, although perceptual fluency was associated with perceived psychological distance, it did not explain the effect of manipulated emotionality on perceived psychological distance.

These results indicate that emotional intensity reduces perceived psychological distance to both positive and negative events. The absence of an interaction between emotionality and valence and the fact that emotionality reduced perceived psychological distance to negative events in Experiments 1 and 2 indicate that the effect of emotionality on perceived psychological distance is independent of people's desire to be of greater or lesser distance form those events (Ross & Wilson, 2002). These results raise the question, to which we return in the General Discussion, of how to reconcile our findings with previous findings that people report desirable past selves to be psychologically closer than undesirable past selves. In brief, we suspect that perceived psychological distance to selves (as in previous research) has more evaluative implications for present selves, which highlights motivational considerations, more than the perceived psychological distance to events (as in the present research).

Experiment 4: Performers and Observers

We next sought to replicate our finding that emotional intensity reduces perceived psychological distance with three extensions. First, we sought to manipulate emotional intensity about a near-future event indirectly through assignment to social roles rather than through explicit instructions to describe events emotionally or neutrally. Such an indirect manipulation helps avoid the possibilities of experimental demand or the interference of some other aspect of the explicit instructions to describe events in a specific way. Accordingly, we randomly assigned people either to perform a dance before an audience or to observe others dancing. We expected performers would feel more emotionally intense than observers (Van Boven, Loewenstein, & Dunning, 2005; Van Boven, Loewenstein, Dunning, & Welch, 2009). We therefore predicted that performers would perceive the dancing as less psychologically distant than would observers.

Second, we sought to examine more precisely the effect of emotional intensity on perceived psychological distance by measuring participants' self-reported emotional intensity. We predicted that emotional intensity would be negatively correlated with perceived psychological distance and would statistically mediate the effect of being a performer or observer on perceived psychological distance.

Finally, we examined whether the effect of emotionality on perceived psychological distance might be partly attributable to emotionality's influence on estimated objective distance, that is, whether people perceive an event as less psychologically distant when they feel relatively intense emotions because emotional intensity causes people to perceive events as less objectively distant. We think this possibility is unlikely given that participants in our previous experiments identified events and reported objective distance before the emotionality manipulation. Those experiments also provided suggestive evidence, however, that objective distance is correlated with perceived psychological distance: partial $r = .41$, $p < .005$, in Experiment 2 (controlling for emotionality, tense, and their interaction); partial $r = .20$, $p = .07$, in Experiment 3 (controlling for emotionality, valence, and their interaction). Because we did not measure perceived objective distance after the emotionality manipulation, it is possible (if unlikely) that emotionality caused participants to revise their estimates of objective distance, which contributed to the effect of emotionality on perceived psychological distance. To more directly examine the role of perceived objective distance, we tested whether performers and observers, after learning their roles, would perceive objective distance (in minutes) differently.

Method

Fifty university undergraduates at the University of Colorado at Boulder, participating in groups of eight to 16 in exchange for course credit, were told they would take part in a study of social evaluation. Within each group, participants were then randomly assigned to the role of either performer or observer, with the stipulation that approximately half of the participants within each group were assigned to each role. Performers were each told that starting in 15 min, they would dance alone, in random order, for 1 min to Devo's song "Whip It" (Casale & Mothersbaugh, 1980). Observers were told that they would watch the performers but would not dance themselves.

At 15, 7, and 1 min before the dancing began, participants reported how psychologically distant the dancing seemed (1 = *feels very close,* 10 = *feels very far away*). At 7 and 1 min before

dancing, participants also estimated how many minutes remained until the dancing. (Participants did not estimate objective distance with 15 min remaining, as they had just been told that the dancing would begin in 15 min.) After the final measures of perceived psychological distance and time estimates, we measured emotional intensity by asking participants to report how much (1 = *very slightly or not at all,* 5 = *quite a bit*) they felt afraid, anxious, amused, distressed, enthusiastic, embarrassed, excited, fearful, happy, jittery, nervous, and scared. After appropriate reverse scoring, we averaged participants' reported emotions into an index of negative emotional intensity ($\alpha = .92$). Participants were then relieved of having to dance, thanked, and debriefed.

Results and Discussion

As predicted, performers perceived the dancing as less psychologically distant than did observers (see Figure 1). Because four performers and four observers did not report psychological distance at one of the three measures, we replaced the eight missing data (5% of the 150 total data) with the corresponding condition mean. We then submitted perceived psychological distance to a 2 (role: performer, observer) × 3 (time remaining: 15, 7, and 1 min) mixed model ANOVA with repeated measures on the second factor. Not surprisingly, this analysis yielded a main effect of time remaining, $F(2, 96) = 97.39$, $p < .001$, reflecting that participants perceived the dancing as psychologically closer when it was objectively closer.

More important was a main effect of role, reflecting that performers perceived the dancing as less psychologically distant ($M = 3.64$) than did observers ($M = 4.88$), $F(1, 48) = 8.15$, $p < .01$.[5] The interaction between role and time remaining was not significant ($F < 1$). Being in a social role that aroused relatively intense emotions thus reduced the perceived psychological distance of a future event compared with being in a less arousing social role, without any explicit instructions to contemplate the event emotionally.

Performers also reported more intense negative emotion ($M = 3.03$, $SD = 0.86$) than did observers ($M = 2.17$, $SD = 0.68$), $t(48) = 3.96$, $p < .001$. Moreover, participants' emotional intensity was negatively correlated with perceived psychological distance (averaged across the three estimates, without replacing missing data, $\alpha = .98$, partial $r = -.35$, $p < .025$, controlling for participants' role). A mediation analysis (Judd & Kenny, 1981) indicated that the effect of role on psychological distance was significantly reduced (from $r = -.36$, $p < .01$, to partial $r = -.17$, *ns*) when emotional intensity was included in a regression model (Sobel $z = 2.17$, $p < .025$). The more intense the emotions participants reported, the less psychologically distant they perceived the dancing to be, and the effect of social role on emotional intensity statistically mediated the effect of social role on perceived psychological distance.

Although objective distance was associated with perceived psychological distance, as indicated by the main effect of time reported above, performers and observers did not estimate objective time differently. A 2 (role: performer, observer) × 2 (remaining time: 7 min, 1 min) ANOVA on estimated objective time with repeated measures on the second factor indicated only that participants estimated less remaining time when less time remained, $F(2, 44) = 434.99$, $p < .001$. Neither of the other effects was significant (Fs < 1).

These results conceptually replicate and extend the finding that emotional intensity reduces perceived psychological distance in three important ways. First, using randomly assigned social roles to manipulate whether people felt greater or lesser emotional intensity about an event mitigates any concerns such as demand characteristics or instructions unrelated to emotionality that might have been associated with explicit instructions to describe events emotionally or neutrally. Second, the fact that performers perceived dancing to be less psychologically distant but not less objectively distant than observers reiterates the independence of perceived psychological and objective distance. That is, emotional intensity makes events seem psychologically closer but does not make them seem objectively closer.

Finally, these results provide some direct, albeit correlational, evidence for the causal role of emotional intensity in reducing perceived psychological distance. Self-reported emotional intensity was negatively correlated with perceived psychological distance, and emotional intensity statistically mediated the effect of social role on psychological distance. This finding is consistent with our hypothesis that people who feel more emotionally intense about an event perceive it as less psychologically distant than people who feel less emotionally intense about the same event. In supporting the causal role of emotional intensity, this mediation analysis also casts doubt that other factors such as fluency, visual perspective, construal level, or other differences between performers and observers act as reasons why the performers perceived the dancing as less psychologically distant than did the observers.

Experiment 5: Misattributing Emotions

The hypothesis that emotional intensity about an event reduces the event's perceived psychological distance implies that the negative correlation between emotional intensity and perceived psychological distance of a particular event should be reduced when people attribute their emotional intensity to something other than that event. When people perceive that their emotional intensity to be aroused by something other than the target event, their emotional intensity no longer signifies the target event's psychological distance (Olson, 1988; Ross & Olson, 1981; Savitsky, Medvec, Charlton, & Gilovich, 1998). Emotional intensity is therefore less likely to reduce the event's perceived psychological distance. We tested this prediction by implying to some people that their emotions about an upcoming event (public dancing) were attributable to an unrelated source (whale songs). We predicted that the magnitude of the negative correlation between emotional intensity and perceived psychological distance would be reduced among people who were invited to misattribute their emotions compared with people in a control condition.

Method

Twenty-four university undergraduates at the University of Colorado at Boulder participating in exchange for course credit were asked to take part in a study of impression formation. They were

[5] These tests remained significant when excluding missing data.

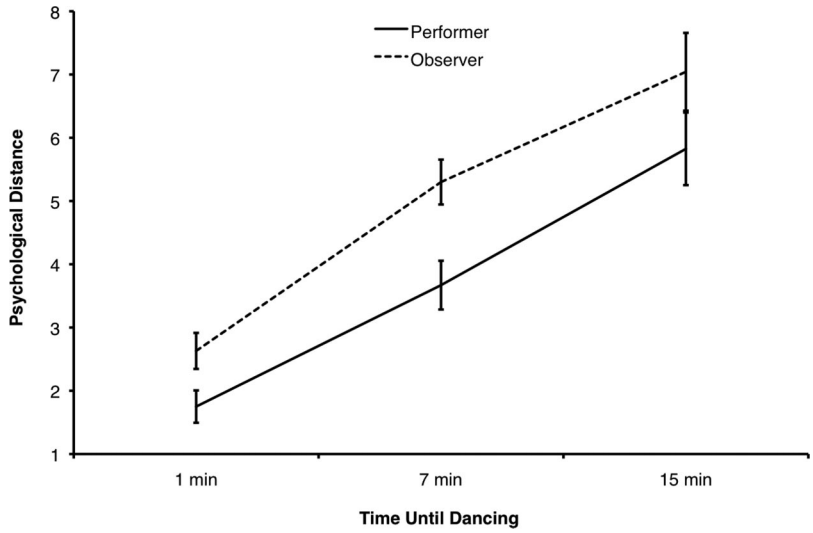

Figure 1. Performers' and observers' perceived psychological distance to dancing with 1, 7, and 15 minutes remaining. Higher numbers indicate greater perceived psychological distance.

told that in 15 min they would dance to Devo's "Whip It," as in Experiment 4, for 1 min in front of the experimenter and a video camera. Their videotaped performance would ostensibly be shown to participants in a later study of impression formation.

While waiting, participants were asked to complete an unrelated marketing study concerning product evaluation, simple cognitive tasks, and auditory stimuli. As part of the product evaluation, participants donned a pair of headphones and listened to whale songs (Ocean Mammal Institute, 2008) while completing questionnaires. The songs included recordings of blue whale vocalizations and were sufficiently ambiguous that their purported emotional effects could be experimentally manipulated.

Participants were randomly assigned to either the control condition or the misattribution condition. Those in the control condition were told that previous research indicated the songs "did not influence cognitive performance." Those in the misattribution condition were told the songs might arouse "anxiety and fear . . . because they are so eerie and haunting." To instantiate the manipulation, participants were asked to describe why listening to the songs might have the purported effects.

After 4 min of listening to the whale songs, participants were informed that they would start dancing in 11 min and then reported the dancing's psychological distance (1 = *seems very close,* 7 = *seems very far away*).[6] Participants also reported how intensely (1 = *very slightly or not at all,* 5 = *very much*) they felt anxious, amused, embarrassed, excited, nervous, and scared. After completing these measures, participants were relieved of having to dance, thanked, and debriefed.

Results and Discussion

As predicted, the relationship between emotional intensity and perceived psychological distance was more strongly negative in the control condition than in the misattribution condition (see Figure 2). After appropriate reverse scoring, we averaged participants' reported emotions into an index of negative emotion (α = .61) that did not significantly differ by condition ($t < 1$). In a multiple regression, we then estimated participants' perceived psychological distance from their reported emotional intensity, misattribution condition (−1 = control, 1 = misattribution), and their interaction. As predicted, the interaction between emotional intensity and misattribution condition ($b = .64$, $SE = .18$) was significant, $t(20) = 3.48$, $p < .001$. Negative emotional intensity was inversely correlated with perceived psychological distance in the control condition ($r = -.82$, $p < .001$) but was positively correlated with perceived psychological distance in the misattribution condition, although the correlation was not significant ($r = .43$, $p = .125$).

These results indicate that the tendency for emotional intensity to reduce perceived psychological is reduced, even reverses, when people misattribute their emotions to an unrelated source. This finding provides additional evidence that emotional intensity about a target event reduces that event's perceived psychological distance, but not when the same degree of emotional intensity is misattributed to another source. That the correlation between emotional intensity and perceived psychological distance was reversed when participants were invited to attribute their emotions to the whale songs may reflect an overcorrection for the use of emotional intensity to perceive psychological distance and is an interesting question for future research.

Experiment 6: Multidimensional Distance

A comprehensive analysis of perceived psychological distance would ideally explain what makes things seem of greater or lesser

[6] Notice that in Experiments 5 and 6, participants reported how close or distant an event *seemed* rather than how close or far an event *felt*, as in our previous experiments. This change in wording avoided the possibility that emotional intensity would be associated with perceived psychological distance only when perceiving how close or far events feel.

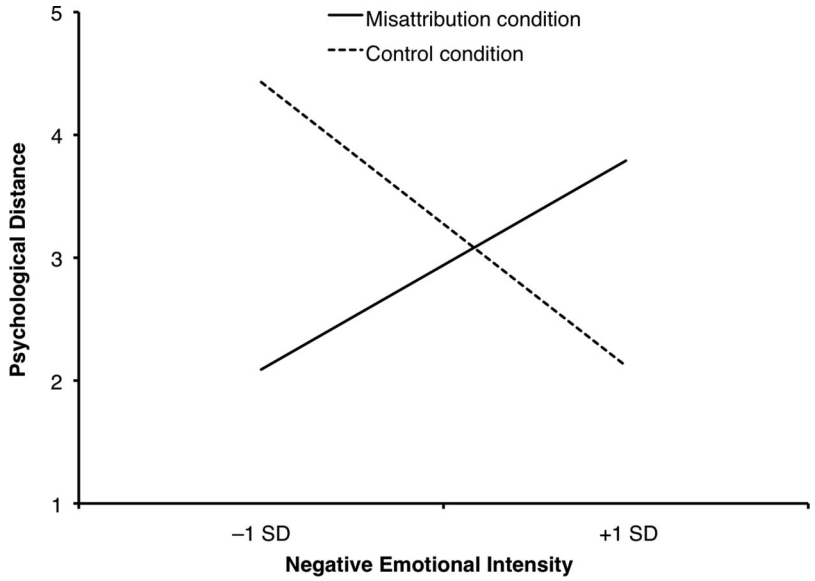

Figure 2. Estimated means of perceived psychological distance to dancing in 11 minutes, as a function of participants' reported emotional intensity and whether they were told nothing about whale songs they listened to (control condition) or that the whale songs might make them feel afraid and anxious (misattribution condition).

psychological distance across multiple dimensions (Lewin, 1951; Liberman & Trope, 2008). A generalization of our definition that perceived psychological distance is grounded in the phenomenology of objective distance from time to other dimensions would imply that emotional intensity about events might make those events seem psychologically closer in multiple dimensions, including time, space, and sociality. In everyday experience, people may feel more intense emotions when events are objectively closer in temporal, spatial, and social distance. People may therefore associate emotionality with perceived psychological distance in each dimension—just as people associate emotionality with perceived psychological distance in time—such that emotional intensity reduces multidimensional perceptions of psychological distance.

In a preliminary test of whether emotional intensity might reduce perceived psychological distance across multiple dimensions, we asked members of the University of Colorado at Boulder community to describe, either emotionally or neutrally, the 2007 shootings at Virginia Tech. The shootings were somewhat distant in temporal, spatial, and social dimensions. We predicted that perceptions of psychological distance would be correlated across these three dimensions and that emotional descriptions would reduce multidimensional perceptions of psychological distance.

Method

Thirty-four participants on the University of Colorado at Boulder campus were asked to complete a survey in exchange for a nonalcoholic iced tea (Snapple). Participants were asked to write either emotional or neutral descriptions, as in previous experiments, of the April 17, 2007, shootings at Virginia Tech in Blacksburg, Virginia. Participants were reminded that the tragedy had occurred 4 days earlier and 1,350 miles away. Participants then reported how close (1 = *seems very close,* 9 = *seems very distant*) the tragedy seemed in psychological distances of time, space, and sociality after reading that "[incidents or other people] may seem very distant or very close, regardless of [when or where] they actually [occurred or are]."

Results and Discussion

Perceptions of temporal, spatial, and social distances were highly correlated ($\alpha = .78$, average $r = .50$). We averaged the three ratings into a multidimensional index of perceived psychological distance. As predicted, participants reported the Virginia Tech tragedy was less psychologically distant across multiple dimensions when described emotionally ($M = 3.35$, $SD = 1.56$) rather than neutrally ($M = 4.60$, $SD = 1.89$), $t(32) = 2.11$, $p < .05$ (see Table 1).

These results provide preliminary evidence that multiple dimensions of perceived psychological distance to an event are closely correlated, reflecting a shared, underlying perception of psychological distance (Lewin, 1951; Liberman & Trope, 2008). These results also indicate that describing an event emotionally reduces perceived psychological distance across these multiple dimensions of distance. These findings highlight the generalizability of our findings across multiple dimensions of psychological distance. These results also imply that emotionality influences a shared underlying dimension of psychological distance.

General Discussion

The phenomenological foundations of psychological distance have been hidden in plain sight of social psychological science. Although psychological distance is a widely used theoretical construct, there has been little clarity about what makes things seem of greater or lesser psychological distance. We have suggested that perceived psychological distance is grounded in and influenced by the phenomenology naturally associated with objective distance. In

particular, because emotional intensity is typically associated with reductions in objective distance, emotional intensity reduces perceived psychological distance. People who described events emotionally rather than neutrally perceived those events as less psychologically distant, including embarrassing moments (Experiment 1), past and future dentist visits (Experiment 2), positive and negative events (Experiment 3), and a national tragedy (Experiment 6). People also perceived an event (dancing in front of an audience) as less psychologically distant when they were in a more emotionally arousing social role (that of performer) rather than less a less emotionally arousing social role (that of observer; Experiment 5).

Two findings highlight the role of emotional intensity in reducing perceived psychological distance. First, reported emotional intensity was negatively correlated with perceived psychological distance and statistically mediated the effect of being in an emotionally arousing social role on perceived psychological distance (Experiment 4). Second, providing people with an alternative interpretation of their emotional intensity (whale songs) significantly reduced, even reversed, the negative correlation between self-reported emotional intensity and perceived psychological distance (Experiment 5). That is, when people were led to misattribute their emotional intensity to something other than the target event, their emotional intensity no longer reduced that event's perceived psychological distance.

Phenomenological Foundations of Psychological Distance

The idea that the phenomenology of objective distance influences perceived psychological distance—the idea from which our central hypothesis about emotionality is derived—also implies that other, nonemotional, cognitive experiences should influence perceived psychological distance. Three findings from our experiments speak to this possibility. First, we found in three experiments that perceptual fluency, the ease with which people think about events (Alter & Oppenheimer, 2008; Unkelbach, 2006), was correlated with perceived psychological distance (Experiments 1, 2, and 3). Manipulated emotionality did not influence fluency, however, and the effects of emotionality on perceived psychological distance remained significant, controlling for fluency. Second, we found in one experiment that the degree to which people imagine themselves from a third-person perspective (Frank & Gilovich, 1989; Libby & Eibach, 2002; Nigro & Neisser, 1983) was marginally significantly correlated with perceived psychological distance (Experiment 2). Manipulated emotionality did not, however, influence visual perspective, and the effect of emotionality on perceived psychological distance remained significant, controlling for visual perspective. These results suggest that perceptual fluency and visual perspective may independently influence perceived psychological distance, but neither cognitive experience explains why emotionality reduces psychological distance.

Finally, because people tend to construe objectively close events more concretely than they construe objectively distant events (Liberman, Trope, & Stephan, 2007), people might perceive concretely construed events as less psychologically distant. We did not, however, find any evidence in our experiments for an association between construal level and perceived psychological distance. Neither self-reported construal level nor mental representation specificity was affected by our emotionality manipulation (in the follow-up to Experiment 1). Moreover, further theoretical analysis implies that the direction of association between emotional intensity and construal level would seem to depend on the emotion's relative abstractness (Liberman, Trope, McCrea, & Sherman, 2007; Liberman, Trope, & Stephan, 2007). For example, whereas love typically involves abstract representations with longer time frames, lust typically involves concrete representations with shorter time frames (Forster, Epstude, & Ozelsel, 2009). Many self-conscious emotions such as embarrassment and social anxiety (as in Experiments 1, 4, and 5) require some degree of abstraction to represent the self in others' eyes (Beer & Keltner, 2004). Also, approach-oriented emotions may be more abstract than avoidance-oriented emotions because "pros" tend to be associated with more abstract construal than "cons" (Eyal, Liberman, Trope, & Walther, 2004). Construal level thus neither implies nor explains the general tendency for emotional intensity to reduce perceived psychological distance. Whether perceived psychological distance is interactively influenced by emotional intensity and abstractness is a question for future research.

Potential Moderators

Our results raise at least three questions about potential moderators of the emotional nature of perceived psychological distance. First, the tendency for emotional intensity to reduce perceived psychological distance may sometimes be moderated by the motivated perception of distance to past selves to maintain favorably appraised present selves (Ross & Wilson, 2002; Wilson & Ross, 2001). Previous research demonstrated that people perceive undesirable past selves as more psychologically distant, and hence less reflective of the current self, than desirable past selves (Ross & Wilson, 2002). Our findings that emotional intensity reduced perceived psychological distance to negative events would seem at odds with those prior findings. We suspect that this apparent discrepancy is because previous studies measured perceived distance of selves whereas the present experiments measured perceived distance of events. Whereas psychologically close negative selves (e.g., an embarrassing personality trait) reflect poorly on the self, heightening motivational consideration, psychologically close negative events (e.g., an embarrassing moment) do not reflect poorly on the self.

Second, although our theoretical analysis implies that emotional intensity generally reduces perceived psychological distance, our experiments emphasized emotional reactions to negative events. This raises the question of whether perceived psychological distance is equally reduced by negative and positive emotional intensity. Because it has been suggested that people respond more strongly to negative than to positive emotion (e.g., Baumeister et al., 2001; Rozin & Royzman, 2001), it may be that although perceived psychological distance is reduced by both negative and positive emotional intensity—consistent with our theoretical analysis and with the results of Experiment 3—the effect may be stronger for negative emotional intensity.

Finally, there may be differences in emotional intensity's tendency to reduce perceptions of temporal, spatial, and social psychological distance. In particular, interpersonal liking may moderate the effect of emotionality on perceived social psychological distance more than other types of distance such that emotional

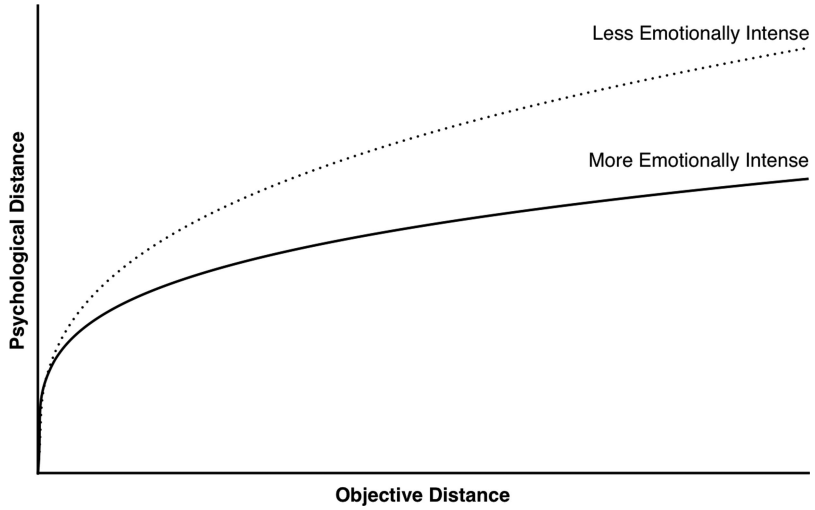

Figure 3. A graphical representation of the theoretical relation between psychological distance, objective distance, and people's emotional intensity about the event.

intensity reduces perceived distance of liked more than disliked people. For instance, whereas emotional intensity might reduce perceived psychological distance to a liked coworker, it might increase perceived distance of a disliked coworker. Although it remains for future research to directly test this prediction, we suspect that the answer is not so simple. Whereas people are unlikely to colloquially refer to a disliked, irritating coworker as close, they might also refer to the same coworker as invading personal space or being too close for comfort—descriptions that may reflect unwanted psychological proximity.

Broader Theoretical Implications and Conclusion

The fact that emotional intensity influences perceived psychological distance has at least three broader theoretical implications. The first concerns a more formal, comprehensive representation of perceived psychological distance as an interactive function of objective distance and emotional intensity. Following many psychophysical functions, perceived psychological distance is likely a power function of objective distance (Stevens, 1975), with perceived psychological distance increasing sharply with initial increases in objective distance before increasing more gradually with subsequent increases in objective distance (see Figure 3). Our finding that emotional intensity reduces perceived psychological distance implies that when people feel relatively stronger emotional intensity about events, the relationship between objective distance and perceived psychological distance is characterized by relatively larger, less compressive exponents compared with when people feel relatively less emotionally intense about events.

Second, the fact that emotional intensity influences the relationship between objective distance and perceived psychological distance might violate the important assumption made by many decision scientists that time discounting is independent of the type of experience being discounted (Ainslie & Haslam, 1992; Read, 2004). That is, a common assumption is that the rate at which a future outcome's present value decreases as the outcome's objective distance increases is constant across different types of outcomes and different mental representations of the same outcome. Our experiments suggest, in contrast, that events are discounted less steeply when people feel more intense rather than less intense emotions about those events because they perceive those emotionally evocative events as less psychologically distant (see Figure 3).

One final broad theoretical question is whether emotional intensity influences perceived psychological distance or actual psychological distance. The answer depends critically on how psychological distance is conceptualized. If psychological distance reflects people's interpretation, or appraisal, of psychological space, then perceived and actual psychological distances are one and the same. That is, psychological distance is what people perceive it to be. If, however, actual psychological distance is a latent construct that exists somewhat independently of perceived psychological distance, then emotional intensity might make events seem less distant without actually reducing psychological distance. We suspect that perceived and actual psychological distances are homologous, that psychological distance is what people perceive it to be—a belief that is bolstered by findings that perceived psychological distance independently influences thoughts, feelings, and behaviors.

In conclusion, this discussion highlights that deep theoretical and empirical questions remain about the nature of psychological distance and its perception. We hope that interest generated by our findings helps bring answers to these broad questions closer, both objectively and psychologically.

References

Ainslie, G., & Haslam, N. (1992). Hyperbolic discounting. In G. Loewenstein & J. Elster (Eds.), *Choice over time* (pp. 57–92). New York, NY: Russell Sage Foundation.

Alter, A. L., & Oppenheimer, D. M. (2008). Effects of fluency on psychological distance and mental construal (or why New York is a large city, but *New York* is a civilized jungle). *Psychological Science, 19,* 161–167.

Ayduk, O., & Kross, E. (2008). Enhancing the pace of recovery: Self-distanced analysis of negative experiences reduces blood pressure reactivity. *Psychological Science, 19,* 229–231.

Baumeister, R. F., Bratslavsky, E., & Finkenauer, C. (2001). Bad is stronger than good. *Review of General Psychology, 5,* 323–370.

Beer, J. S., & Keltner, D. (2004). What is unique about self-conscious emotions? *Psychological Inquiry, 15,* 126–170.

Broemer, P., Grabowski, A., Gebauer, J. E., Ermel, O., & Diehl, M. (2008). How temporal distance from past selves influences self-perception. *European Journal of Social Psychology, 38,* 697–714.

Casale, G., & Mothersbaugh, M. (1980). *Whip it* [Recorded by Devo]. Los Angeles, CA: Warner Bros.

Eibach, R. P., Libby, L. K., & Gilovich, T. (2003). When change in the self is mistaken for change in the world. *Journal of Personality and Social Psychology, 84,* 917–931.

Eyal, T., Liberman, N., & Trope, Y. (2008). Judging near and distant virtue and vice. *Journal of Experimental Social Psychology, 4,* 1204–1209.

Eyal, T., Liberman, N., Trope, Y., & Walther, E. (2004). The pros and cons of temporally near and distant action. *Journal of Personality and Social Psychology, 86,* 781–795.

Forster, J., Epstude, K., & Ozelsel, A. (2009). Why love has wings and sex has not: How reminders of love and sex influence creative and analytic thinking. *Personality and Social Psychology Bulletin, 35,* 1479–1491.

Frank, M. G., & Gilovich, T. (1989). Effect of memory perspective on retrospective causal attribution. *Journal of Personality and Social Psychology, 57,* 399–403.

Frijda, N. H. (1988). The laws of emotion. *American Psychologist, 43,* 349–358.

Frijda, N. H. (1992). The empirical status of the laws of emotion. *Cognition & Emotion, 6,* 467–477.

Gilovich, T., Kerr, M., & Medvec, V. H. (1993). Effect of temporal perspective on subjective confidence. *Journal of Personality and Social Psychology, 64,* 552–560.

Jackson, F. (1982). Epiphenomenal qualia. *Philosophical Quarterly, 32,* 127–136.

Judd, C. M., & Kenny, D. A. (1981). Process analysis: Estimating mediation in treatment evaluations. *Evaluation Review, 5,* 602–619.

Kane, J. (2009). Tethered by tense: Retrospection is more constrained than prospection. *Dissertation Abstracts International: Section B. Sciences and Engineering, 69,* 7188B.

Keltner, D., & Gross, J. J. (1999). Functional accounts of emotion. *Cognition & Emotion, 13,* 467–480.

Kross, E., & Ayduk, O. (2008). Facilitating adaptive emotional analysis: Distinguishing distanced-analysis of depressive experiences from immersed-analysis and distraction. *Personality and Social Psychology Bulletin, 34,* 924–938.

Kross, E., Ayduk, O., & Mischel, W. (2005). When asking "why" does not hurt. *Psychological Science, 16,* 709–715.

Kurtz, J. (2008). Looking to the future to appreciate the present: The benefits of perceived temporal scarcity. *Psychological Science, 19,* 1238–1241.

Lazarus, R. S. (1991). *Emotion and adaptation.* New York, NY: Oxford University Press.

Lerner, J., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology, 81,* 146–159.

Lewin, K. (1951). *Field theory in social science.* New York, NY: Harper.

Lewis, C. I. (1929). *Mind and the world order: An outline of a theory of knowledge*. New York, NY: Scribner.

Libby, L. K., & Eibach, R. P. (2002). Looking back in time: Self-concept change affects visual perspective in autobiographical memory. *Journal of Personality and Social Psychology, 82,* 167–179.

Liberman, N., Sagristano, M. D., & Trope, Y. (2002). The effect of temporal distance on level of mental construal. *Journal of Experimental Social Psychology, 38,* 523–534.

Liberman, N., & Trope, Y. (1998). The role of feasibility and desirability considerations in near and distant future decisions: A test of temporal construal theory. *Journal of Personality and Social Psychology, 75,* 5–18.

Liberman, N., & Trope, T. (2008, November 21). The psychology of transcending the here and now. *Science, 322,* 1201–1205.

Liberman, N., Trope, Y., McCrea, S. M., & Sherman, S. J. (2007). The effect of level of construal on the temporal distance of activity enactment. *Journal of Experimental Social Psychology, 43,* 143–149.

Liberman, N., Trope, Y., & Stephan, E. (2007). Psychological distance. In A. W. Kruglanski & E. T. Higgins (Eds.), *Social psychology: Handbook of basic principles* (Vol. 2, pp. 353–384). New York, NY: Guilford Press.

Loewenstein, G. (1996). Out of control: Visceral influences on behavior. *Organizational Behavior and Human Decision Processes, 65,* 272–292.

Metcalfe, J., & Mischel, W. (1999). A hot/cool-system analysis of delay of gratification: Dynamics of willpower. *Psychological Review, 106,* 3–19.

Miller, N. (1944). Experimental studies of conflict. In M. Hunt (Ed.), *Personality and the behavior disorders* (pp. 431–465). New York, NY: Ronald Press.

Nigro, G., & Neisser, U. (1983). Points of view in personal memories. *Cognitive Psychology, 15,* 467–482.

Nussbaum, S., Trope, Y., & Liberman, N. (2003). Creeping dispositionalism: The temporal dynamics of behavior prediction. *Journal of Personality and Social Psychology, 84,* 485–497.

Ocean Mammal Institute. (2008). *Listen to the songs of the humpback whale* [WAV file]. Retrieved from http://www.oceanmammalinst.org/songs.html

Olson, J. M. (1988). Misattribution, preparatory information, and speech anxiety. *Journal of Personality and Social Psychology, 54,* 758–767.

Ramachandran, V. S., & Hirstein, W. (1997). Three laws of qualia. *Journal of Consciousness Studies, 4,* 429–458.

Read, D. (2004). Intertemporal choice. In D. J. Koehler & N. Harvey (Eds.), *The Blackwell handbook of judgment and decision making* (pp. 424–443). Oxford, England: Blackwell Publishing.

Robinson, J. A., & Swanson, K. L. (1993). Field and observer modes of remembering. *Memory, 1,* 169–184.

Ross, M., & Olson, J. M. (1981). An expectancy-attribution model of the effects of placebos. *Psychological Review, 88,* 408–437.

Ross, M., & Wilson, A. E. (2002). It feels like yesterday: Self-esteem, valence of personal past experiences, and judgments of subjective distance. *Journal of Personality and Social Psychology, 82,* 792–803.

Rozin, P., & Royzman, E. B. (2001). Negativity bias, negativity dominance, and contagion. *Personality and Social Psychology Review, 5,* 296–320.

Sanna, L. J., Parks, C. D., Chang, E. C., & Carter, S. E. (2005). The hourglass is half full or half empty: Temporal framing and the group planning fallacy. *Group Dynamics: Theory, Research, and Practice, 9,* 173–188.

Savitsky, K., Medvec, V. H., Charlton, A. E., & Gilovich, T. (1998). "What, me worry?" Arousal, misattribution, and the effect of temporal distance on confidence. *Personality and Social Psychology Bulletin, 24,* 529–536.

Stevens, S. S. (1975). *Psychophysics: Introduction to its perceptual, neural, and social prospects.* New York, NY: Wiley.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110,* 403–421.

Unkelbach, C. (2006). The learned interpretation of cognitive fluency. *Psychological Science, 17,* 339–345.

Van Boven, L., & Ashworth, L. (2007). Looking forward, looking back: Anticipation is more evocative than retrospection. *Journal of Experimental Psychology: General, 136,* 289–300.

Van Boven, L., Kane, J., & McGraw, A. P. (2008). Temporally asymmetric constraints on mental simulation: Retrospection is more constrained than prospection. In K. Markman, W. Klein, & S. Shur (Eds.), *The handbook*

of imagination and mental simulation (pp. 131–149). New York, NY: Psychology Press.

Van Boven, L., Loewenstein, G., & Dunning, D. (2005). The illusion of courage in social predictions: Underestimating the impact of fear of embarrassment on other people. *Organizational Behavior and Human Decision Processes, 96,* 130–141.

Van Boven, L., Loewenstein, G., Dunning, D., & Welch, N. (2009). *The illusion of courage in self-predictions: When people underestimate the impact of social anxiety on their own behavior.* Unpublished manuscript, University of Colorado at Boulder.

Wakslak, C. J., Nussbaum, S., Liberman, N., & Trope, Y. (2008). Representations of the self in the near and distant future. *Journal of Personality and Social Psychology, 95,* 757–773.

Wilson, A. E., & Ross, M. (2001). From chump to champ: People's appraisals of their earlier and present selves. *Journal of Personality and Social Psychology, 80,* 572–584.

Wohl, M. J. A., & McGrath, A. L. (2007). The perception of time heals all wounds: Temporal distance affects willingness to forgive following an interpersonal transgression. *Personality and Social Psychology Bulletin, 33,* 1023–1035.

Zauberman, G., Kim, B. K., Malkoc, S. A., & Bettman, J. R. (2009). Discounting time and time discounting: Subjective time perception and intertemporal preferences. *Journal of Marketing Research, 46,* 543–556.

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