

# Brand-Aid

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Can close brand relationships insulate against physical pain? The idea that close interpersonal relationships help people cope with pain has received increasing support in social psychology. It is unknown, however, whether close brand relationships can do the same and, if so, why. Seven studies are reported here to fill this knowledge gap. Experiments 1a and 1b are the first to demonstrate that when confronted with a loved brand (vs. control), consumers are able to insulate themselves against physical pain. Experiment 2 provides evidence that the pain-insulating effectiveness of close brand relationships is not just due to brands representing mere distractions. Using a multistudy, multimethod approach to test for mediation, experiments 3 through 5 provide convergent empirical support for the hypothesis that feelings of social connectedness mediate the effect of close brand relationships on pain. Study 6 categorizes the 1,105 brand love essays written by participants in our experiments to show that loved brands provide feelings of social connectedness, mostly metaphorically and indirectly and, to a lesser extent, directly. In summary, close brand relationships can help insulate consumers against physical pain due to brands' ability to provide a semblance of social connectedness.

**Keywords:** close brand relationships, brand love, physical pain, feelings of social connectedness, marketing analgesics

Approximately 20% of consumers suffer from pain at any given time (Goldberg and McGee 2011). When

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recalling painful moments in one's life (e.g., a loss of a loved one, a serious physical injury, or a severe illness), many people find it very soothing to have a close other nearby to help them cope with the pain. Indeed, the idea that support from loved others can insulate against pain has recently received empirical support in social psychology (Eisenberger et al. 2011; Master et al. 2009). But to whom can consumers turn during times of pain if soothing support from loved others is out of reach?

A body of research has pointed to a possible association between psychological stressors and materialistic consumption, implying but not directly showing that consumption objects might help consumers cope with pain. An early insight comes from a study in developmental psychology, in which children were shown to seek material objects (e.g., blankets) to soothe their distress, but only if their mothers were absent and they perceived a lack of social support (Passman 1977). More recently, consumer research has provided additional clues. For example, family stress during childhood may establish trait materialism (Rindfleisch, Burroughs, and Denton 1997). Loneliness can lead consumers to anthropomorphize gadgets such as

alarm clocks (Epley et al. 2008) and induce a preference for nostalgic products (Loveland, Smeesters, and Mandel 2010). Anxiety about one's own death can prompt materialistic consumers to develop self-brand connections (Rindfleisch, Burroughs, and Wong 2009), and fear can cause brand attachment (Dunn and Hoegg 2014).

The present work attempts to coalesce the intriguing body of work on psychological stressors and materialistic consumption (Dunn and Hoegg 2014; Rindfleisch et al. 2009) by conducting the first investigation into whether the experience of physical pain is a possible common denominator of the aforementioned effects. Some researchers actually showed that loneliness results in physical pain insensitivity (DeWall and Baumeister 2006). Herein, we attempt to bring clarity to extant work by showing that a variety of psychological stressors (e.g., loneliness, anger, hopelessness) are physically painful indeed. Importantly, we then go one step further and ask whether consumers can actively leverage consumption objects to cope with pain, thus studying a possible causal impact of material consumption on pain reduction. In this article, we focus on close consumer-brand relationships while asking the question: When consumers are confronted with a loved brand while in pain, what exactly happens? Do they insulate themselves more quickly or slowly against pain, or is there no effect? The extant research is silent about these questions. Recent correlational consumer research implies that material consumption (e.g., buying pleasurable luxuries) could induce *greater* pain in people when they are feeling lonely (Pieters 2013), but concrete experimental examination of the relationship between purchasing or possessing material goods and pain is lacking. To shed light on these unanswered questions, we induced and measured physical pain through a variety of methods (e.g., physical pain from cold water, from remembered physical agony) and examined whether close brand relationships insulate consumers against pain.

Building on the notion of close brand relationships, we test our first hypothesis that "loved" brands—one of the strongest forms of close brand relationships (Ahuvia 2005; Batra, Ahuvia, and Bagozzi 2012)—can serve as a "Band-Aid" for the pain consumers experience in their lives. We test whether loved brands insulate consumers against pain more effectively than control (experiments 1a/b through 5) and distraction (experiment 2).

This research also tests a second hypothesis regarding *why* loved brands enable more effective pain insulation. Our first three experiments, 1a, 1b, and 2, found that the pain-insulating effect of brands is not simply due to a mere distraction from pain. Instead, using a multimethod approach in a series of experiments, we identified feelings of social connectedness as an explanation for the pain-insulating effect of close brand relationships. Experiment 3 provides first clues on the mediating role of feelings of social connectedness by testing whether loved

anthropomorphized brands (i.e., those credited with human-like characteristics) are more effective in insulating against pain than loved objectified brands (i.e., those credited with functional features). Experiment 4 employs a moderation-of-process design (Spencer, Zanna, and Fong 2005) to investigate whether heightened feelings of social connectedness lower the pain-insulating effect of close brand relationships. Experiment 5 tests for statistical mediation by feelings of social connectedness. Study 6 takes a bird's-eye view of the loved brand essays written by our participants to see whether loved brands induce feelings of social connectedness either directly, indirectly, or metaphorically.

In examining these two hypotheses, this article fuses research on the role of social support in pain experiences (Eisenberger et al. 2011; Master et al. 2009) with work on close consumer-brand relationships (Fournier 1998; Lastovicka and Sirianni 2011). We are the first to argue and empirically show that close brand relationships instill feelings of social connectedness, which in turn enable consumers to insulate themselves against physical pain. In the following section, we offer additional conceptual justification for our account. We then provide converging empirical evidence from seven studies in support of our conceptual argument.

## CONCEPTUAL BACKGROUND AND HYPOTHESES

### Pain

Pain researchers have long studied a body-self system of physical pain (Melzack and Wall 1965), which (1) receives sensory inputs (e.g., applying harmful stimuli to the body), cognitive inputs (e.g., remembering the sensation of physical pain of the past), and emotional inputs (e.g., witnessing someone in physical pain), and which results in (2) withdrawal reflexes and pain vocalization (Loeser and Melzack 1999; Melzack 1999). Physical pain is generally defined as a negative sensory experience as a result of actual or potential tissue damage (Merskey and Bogduk 1994). More recently, researchers have begun to study psychological pain, described as a negative introspective experience involving depression, despair, grief, hopelessness, or shame as a result of bullying, embarrassment, jealousy, social rejection, or the loss of a loved one (MacDonald and Leary 2005; Shneidman 1999). There is mounting evidence that the two forms of pain have more in common than not (Eisenberger 2012a, b; MacDonald and Leary 2005). Both forms share common neurophysiological mechanisms (Eisenberger, Lieberman, and Williams 2003) and can affect each other (Reichert et al. 2013). For example, facial pain expressions boost physical pain experiences, and, after sensing physical pain themselves, observers

perceive others' facial pain expressions as more arousing (Reichert et al. 2013). Besides analgesics, several nondrug methods for pain insulation have been proposed, such as hypnosis (Hilgard 1973), distraction (Barber and Cooper 1972), and social support (reviewed next). In the present work, we induced either physical pain (e.g., by having participants place a hand in cold water or remember physical agony) or psychological pain (e.g., by having participants imagine the loss of a loved one), but we always assessed physical pain on either a well-validated measure depicting six different faces in various states of physical pain (Hicks et al. 2001) or a visual slider measure of physical pain on which participants rated their current physical pain from 0 to 100 (Chou, Parmar, and Galinsky 2016; Portenoy and Kanner 1996).

### The Role of Interpersonal Relationships in Pain Experiences

The role of interpersonal relationships in pain insulation has drawn the attention of patients, caregivers, and researchers alike. Researchers initially found negative correlations between social support and pain experience for patients with chronic pain (Block, Kremer, and Gaylor 1980), during premature labor (Cogan and Spinnato 1988), in cancer treatment (Willey and Silliman 1990), in stroke recovery (Glass and Maddox 1992), and after heart surgery (Kulik and Mahler 1993). Over the last decade, experimental evidence has accumulated showing a causal association between social support and pain. While several groups of researchers have employed temperature-related methods of inducing pain, such as having participants reach into a bucket of cold water (Brown et al. 2003; Jackson et al. 2005; McClelland and McCubbin 2008) or delivering thermal stimulation through a thermode (Master et al. 2009; Montoya et al. 2004; Younger et al. 2010), others have induced pain by reducing blood flow to the arm through a blood pressure cuff (Bohns and Wiltermuth 2012). Across these studies, participants report less pain when receiving social support than when dealing with pain alone or engaging in non-support-related activities. Some research implies that this effect may be independent of whether social support is provided by a friend, stranger (Brown et al. 2003), loved other (Montoya et al. 2004), experimenter (Jackson et al. 2005), or confidant (Bohns and Wiltermuth 2012). However, more recent research suggests that holding a loved other's hand is more effective in reducing pain than holding a stranger's hand (Master et al. 2009) and that viewing pictures of a romantic partner lessens pain more effectively than viewing pictures of an equally attractive acquaintance (Younger et al. 2010) or stranger (Eisenberger et al. 2011; Master et al. 2009).

### The Role of Close Brand Relationships in Pain Experiences

There are strong indications that one reason consumers form close brand relationships is that brands make consumers feel "respected, listened to, and cared for" (Fournier 1998, 365). Indeed, ratings of brand attachment and ratings of attachment behaviors, such as seeking a safe haven, strongly correlate (Thomson, MacInnis, and Park 2005), implying that consumers may form brand relationships as a refuge from and guardian against psychological stressors. Additionally, there is mounting evidence in consumer psychology that equates relationships with brands to relationships with people: consumers often ascribe human-like traits to brands (Aaker 1997); liken relationships between a human and a brand to relationships between two humans (Fournier 1998); and anthropomorphize products, particularly brands, to make them appear more human-like (Aggarwal and McGill 2012). More often than not, the products with which consumers establish *loving* relationships are specific brands (Ahuvia 2005; Batra et al. 2012). Consumers that have "fallen in love" with a brand feel a strong overlap between their perceived selves and the brand's identity (Reimann and Aron 2009; Reimann et al. 2012). Consumers have also been found to be as attached to brands as they are to beloved humans (Park et al. 2010; Thomson et al. 2005) and to treat them similarly, such as by spending time and money on them (Lastovicka and Sirianni 2011). Neuroimaging research further showed that consumers process perceptions of loved brands within the insula (Reimann et al. 2012), a neuronal cluster that has also been shown to process the perception of loved humans (Bartels and Zeki 2000). These neuroimaging findings are supported by more recent work that showed that marketers' efforts to use human characters for brand advertising have important consequences for consumers' neuronal architecture (Droulers and Adil 2015; Lacoste-Badie and Droulers 2014). It is thus feasible that the boundaries of the brand-human distinction are blurred in consumers' perceptions. Further support for our account comes from research that has shown that counting money (vs. counting paper) reduced physical pain from hot water. In particular, this work argued that money can provide confidence, strength, and efficacy and, thus, can help numb one's pain, because money resembles a resource that can be used to manipulate the social system for one's benefit (Zhou, Vohs, and Baumeister 2009).

Despite the conceptual similarities between interpersonal relationships and brand relationships, it is unknown whether loved brands can effectively insulate against pain. As reviewed in detail in our introduction, prior consumer research has claimed that psychological stressors (e.g., fear, anxiety) may lead to stronger brand relationships (Dunn and Hoegg 2014; Rindfleisch et al. 2009). However, it remains unclear what exactly happens when consumers

have formed such brand relationships. Herein, we attempt to bring clarity to prior work by arguing that close brand relationships help insulate against pain. In summary, if consumers indeed form close brand relationships and process brands similarly to human relationships, it becomes likely that:

**H1:** Close brand relationships insulate against physical pain.

## Close Brand Relationships, Feelings of Social Connectedness, and Pain Experiences

Central to the present work is the question of *why* close brand relationships function like close interpersonal relationships when it comes to pain insulation. As discussed above, social support from close human others enables people to better cope with pain. Could the pain-insulating effect of close brand relationships thus be explained by the activation of a mental representation of social connectedness that a loved brand instills? Close interpersonal relationships have been defined as “mutual influence, interdependence, and degree of interconnectedness of activities” between two humans (Aron et al. 1991, 241). Building on this notion, close brand relationships can thus possibly be understood as perceived interdependence and interconnectedness between a consumer and other humans that endorse, use, or represent the loved brand (Escalas and Bettman 2003; Swaminathan, Page, and Gürhan-Canli 2007). We thus argue that brands have the ability to provide, in the form of feelings, a semblance of social connectedness. We define feelings of social connectedness as affectively charged mental representations about being close to other human beings, which could arise through recollections of past interactions with others (memories) or could be entirely metaphorical (imaginings) (Barrett et al. 2007). We think that brands can trigger feelings of social connectedness in one or a combination of three distinct ways—metaphorically, indirectly, or directly.

*Metaphorical Social Connectedness.* One reason consumers form close brand relationships is that marketing professionals often link their brands to specific human personality traits or even entire human entities, including actor and celebrity endorsers, which can distort the brand–human boundary in the brand knowledge consumers hold (Aaker 1997; Keller 2003; Park and John 2010, 2014). For example, a consumer might love Nike because it provides imaginary closeness to Michael Jordan. Being confronted with a brand one holds dear can thus bring up imaginary mental representations of feeling socially connected to an endorser. Those imaginations are of metaphorical social connectedness, because most consumers neither meet actor and celebrity endorsers in person nor build real social relationships with them.

*Indirect Social Connectedness.* A second reason consumers form close brand relationships is related to interactions with brands through another loved human being. For example, a consumer might love Campbell’s soup because it reminds him of how his beloved grandmother prepared chicken soup for him. Being confronted with a brand one holds dear can thus bring up remembered mental representations of feeling socially connected to a beloved person. Those memories are of indirect social connectedness, because the brand is not the direct source of feelings, but is instead associated with a loved human being.

*Direct Social Connectedness.* A third reason consumers form close brand relationships is related to interactions with a brand’s human representative. For example, a consumer might love Trader Joe’s market because of the same friendly cashier who rings up her purchases at almost every visit. Being confronted with a brand one holds dear can thus bring up remembered mental representations of feeling socially connected to a real-life brand representative. Those memories are of direct social connectedness, because an actual brand employee is the source of the feelings.

If close brand relationships indeed lead to affectively charged mental representations of social connectedness, then we would predict that those feelings have the ability to counteract pain experiences, because they signal quasi-social support. For the reasons stated above, we hypothesize:

**H2:** Feelings of social connectedness explain (mediate) the effect of close brand relationships on physical pain.

## EXPERIMENT 1A: BRAND LOVE INSULATES AGAINST PHYSICAL PAIN FROM COLD WATER

### Overview and Method

The goal of experiment 1a was to test the effect of close brand relationships on pain. We used an established methodology for inducing pain, the cold pressor test, in which participants place their hands in cold water (von Baeyer et al. 2005). Experiment 1a employed a within-subjects experimental design with condition (close brand relationship, control) and time (T1, T2) as within-subjects independent variables and physical pain as the dependent variable. We selected a within-subjects design because physical pain sensitivity can vary among people (Kerns, Sellinger, and Goodin 2011).

*Participants.* Forty-five students from a private high school (45 females,  $M_{\text{age}} = 15.64$  years,  $SE_{\text{age}} = .13$ ) provided both parental and their own written informed consent on a form approved by the university’s committee on



research ethics and then completed the study in exchange for monetary compensation. The study was conducted in the students' school environment. We deliberately recruited only female participants in accordance with the recommendations from extant cold pressor research to control for sex differences (Mitchell, MacDonald, and Brodie 2004). Females were expected to be more candid than males in reporting their pain from cold water, especially because female experimenters ran the study. The sample size was determined by the high school that assigned the students to us, and we did not collect additional data after the first data analysis.

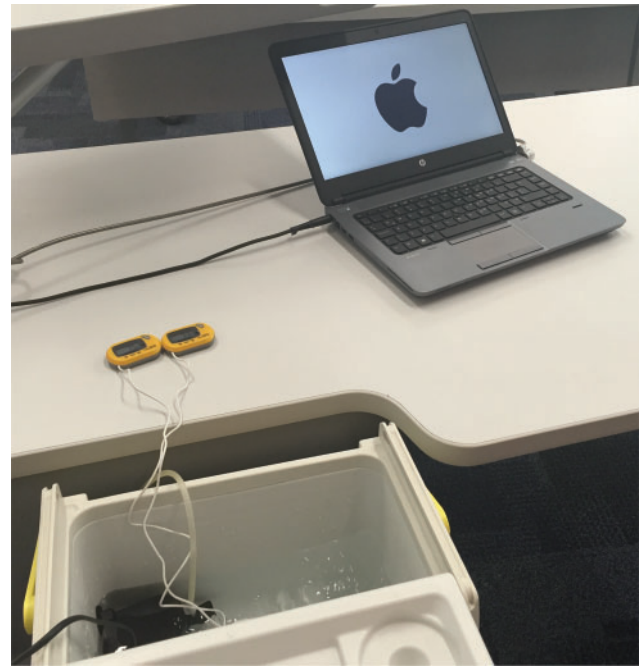
*Procedures and Materials.* Prior to participants' arrival, we set up the cold pressor apparatus and a laptop with the experimental stimuli (see the experimental setup in figure 1). Following pertinent cold pressor test guidelines, the cold pressor apparatus consisted of a small ice chest filled with water, a small pond pump for water circulation, and two thermometers (Mitchell et al. 2004; von Baeyer et al. 2005). We monitored the water temperature constantly and kept it at  $6 \pm .5$  degrees Celsius (equivalent to  $42.8 \pm .9$  degrees Fahrenheit) by regularly refilling the ice chest with ice cubes (which were stored in a separate container). The thermometers were not visible to participants during the experiment.

Upon arrival at the lab, participants were randomly assigned to either the close brand relationship condition followed by the control condition, or the reverse order. Our experimental design allowed for a conservative test of the proposed effect, because half of the participants self-generated a loved brand after partaking in the control condition. Whether they were assigned to the treatment-first or control-first condition resulted in marginally significant differences in pain ratings. Those participants in the treatment-first condition had a higher pain rating for the treatment condition ( $M = -1.96$ ) than those in the control-first condition ( $M = -1.36$ ,  $p = .056$ ), and a lower pain rating for the control condition ( $M = -.91$  vs.  $-1.41$ ,  $p = .096$ ).

If participants were first assigned to the close brand relationship condition, they were asked to self-generate a brand with which they have a love relationship (e.g., Apple, MAC Cosmetics, or Starbucks) and tell the experimenter the name of the brand. No specific definition of loved brand was provided to participants. Out of sight of the participants, the experimenter found a high-quality logo of the named brand on the Internet and pasted the brand logo into a PowerPoint presentation for later use. The experimenter then loaded a default PowerPoint slide, which displayed a fixation cross at its center. The laptop was then turned so that participants could see the screen with the fixation cross. The fixation cross was shown to focus participants' attention onto the screen. Participants were then asked to place their left hand in the water for

FIGURE 1

EXPERIMENT 1A: LABORATORY SETUP



NOTE.—The cold pressor apparatus included an ice chest, a small pond pump for water circulation, two thermometers (later hidden from participants), and a separate chest for ice storage on the floor (not shown). The setup also included a laptop for stimulus presentation.

1 minute and to keep their eyes on the screen for the duration of the experiment. Immediately after taking their hand out of the water, they were asked to rate their overall pain on an established six-point scale of physical pain (Hicks et al. 2001), which displayed six different facial expressions ranging from relaxed (1) to hurting (6). We called this pain rating  $\text{Pain}_{T1}$ . Participants were then shown the logos of their loved brands on the laptop screen for 10 seconds, after which they were asked to rate their pain again ( $\text{Pain}_{T2}$ ). Participants were then asked to immerse their hand in a container filled with warm (room temperature) water for 1 minute before moving on to the control condition in this within-subjects experiment. Finally, age was reported.

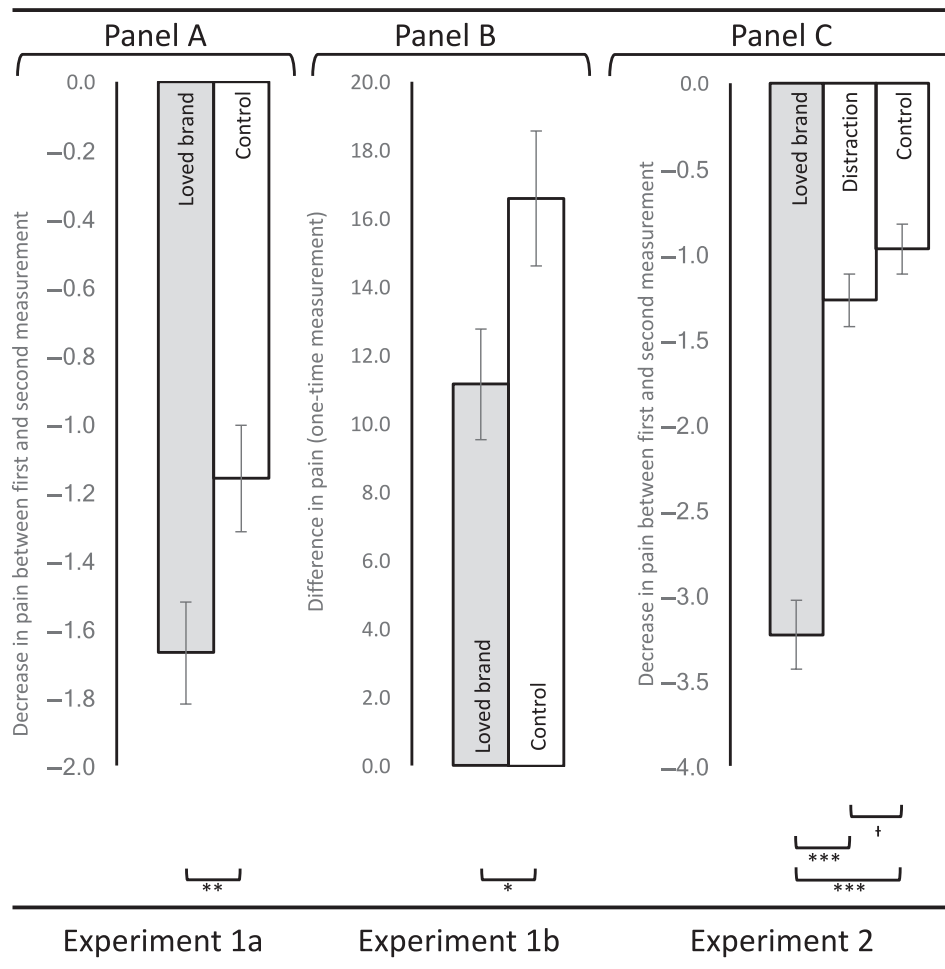
If participants were first assigned to the control condition, they were given identical pain induction instructions, except that participants were not shown their loved brand but instead continued to look at the fixation cross.

## Results

A repeated-measures analysis of variance with condition (close brand relationship, control) and time ( $T1$ ,  $T2$ ) as

FIGURE 2

EXPERIMENTS 1A, 1B, AND 2: EFFECTS OF CLOSE BRAND RELATIONSHIPS ON PAIN

NOTE.—† $p > .05$ , \* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$ 

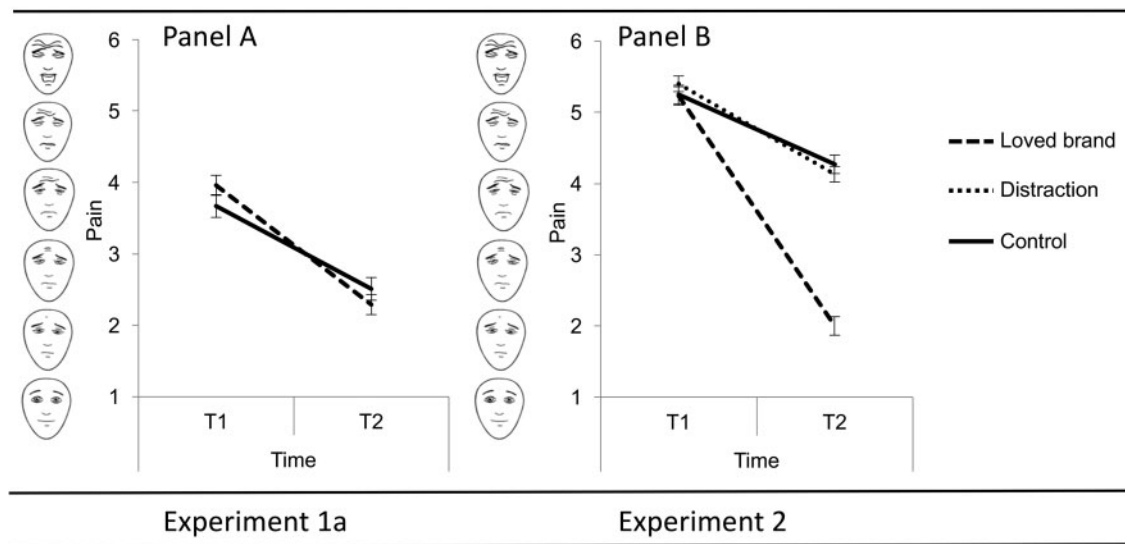
within-subjects independent variables and physical pain as the dependent variable found a significant interaction effect between time and condition on pain,  $F(1, 44) = 8.45$ ,  $p < .01$ ,  $\eta_p^2 = .16$  (see panel A of figure 3). The direct effect of time on pain was significant,  $F(1, 44) = 128.66$ ,  $p < .001$ ,  $\eta_p^2 = .75$ , while the direct effect of condition on pain was not significant ( $p = .838$ ). A paired-samples  $t$  test (see panel A of figure 2) revealed that participants in the close brand relationship condition exhibited a significantly greater decrease in pain between T1 and T2 ( $\Delta = -1.67$ ) than did participants in the control condition ( $\Delta = -1.16$ );  $t(44) = -2.91$ ,  $p = .006$ ,  $d = -.43$ . Web appendix A summarizes the mean pain levels at the two time points as well as the change score for all experiments.

## Discussion

Experiment 1a provides initial support for our hypothesis that close brand relationships insulate against pain. Experiment 1a had set out to test pain insulation over time by measuring pain at two time points. Yet one potential limitation of such a repeated-measures design could be demand effects in the sense that the two pain measurements could provide participants with a subtle cue about the intentions of the experimenters. In an attempt to rule out this possibility, we designed experiment 1b, in which we measured pain only once—that is, we measured it only at one time point, right after the pain induction and treatment/control. While the one-time measurement of pain does not allow for an assessment of pain reduction over time, it is less susceptible to potential demand effects.

FIGURE 3

ACROSS TIME, CLOSE BRAND RELATIONSHIPS INSULATE AGAINST PAIN MORE EFFECTIVELY THAN CONTROL (EXPERIMENTS 1A, 2) AND DISTRACTION (EXPERIMENT 2)



### EXPERIMENT 1B: BRAND LOVE INSULATES AGAINST PHYSICAL PAIN FROM REMEMBERING PHYSICAL AGONY

#### Overview and Method

The goal of experiment 1b was to replicate the effect of close brand relationships on pain with an important methodological difference when compared to experiment 1a. In experiment 1b, we assessed physical pain with a singular, nonrepeated measure (Chou et al. 2016; Portenoy and Kanner 1996). Experiment 1b employed a between-subjects experimental design with condition (close brand relationship, control) as the between-subjects independent variable and physical pain as the dependent variable. Based on the observed effect size in experiment 1a ( $d = .43$ ), we calculated a minimum of 86 participants per condition to yield an alpha (type I error rate) of .05 and power of .80. In our subsequent online experiments, we typically attempted to recruit 120 or more individuals per condition, yet outside of the experimenters' control, the panel provider typically recruits  $\pm 10\text{--}30\%$  more participants than specified, which determined the final sample sizes. We did not collect additional data after the first data analysis, and no complete observations were excluded from the analyses. We determined any duplicate responses by comparing IP addresses or worker identification numbers and omitted those, while retaining those subjects' first responses. These

data collection and analysis rules were also applied in experiments 2–5.

**Participants.** Two hundred ninety-five adult consumers from the general population (129 females,  $M_{\text{age}} = 34.16$  years,  $SE_{\text{age}} = .64$ ) were recruited from Amazon Mechanical Turk, provided consent by agreeing to a disclosure form, and returned complete useable responses in exchange for monetary compensation.

**Procedures and Materials.** Participants were told that the different surveys they were about to engage in were independent studies. Participants were then randomly assigned to one of two conditions.

In the close brand relationship condition, participants were asked to self-generate a brand with which they have a love relationship (e.g., DeWalt, Nintendo, or Trader Joe's) and were told to write the name of the brand in a text input field. No specific definition of loved brand was provided. Participants were then asked to recall a situation in which they got seriously physically hurt (for example, an accident that they had been in, a serious injury, or a very painful illness) and asked to describe in detail the physical pain they felt during that time. On the next screen, participants were then asked to respond to a well-validated measure of physical pain in which they used a visual slider to "choose the overall pain level that best describes how much physical pain you are experiencing RIGHT NOW" (0 = no pain; 100 = worst pain ever experienced) (Chou et al. 2016;

Portenoy and Kanner 1996). During their pain rating, participants were shown their self-generated brand name at the top and bottom of the screen.

In the control condition, participants were first asked to unscramble a simple anagram (i.e., *bakste* with the solution being *basket*) and told to write the solution of the anagram in a text input field. We chose the word *basket* because it describes a neutrally valenced product (Lang, Bradley, and Cuthbert 2008). We assumed that unscrambling an anagram would involve similar levels of cognitive effort compared to self-generating a brand name. Participants then recalled and described their physical pain, and stated their current pain level, as described above (Chou et al. 2016; Portenoy and Kanner 1996). Importantly, participants in the control condition were *not* shown their self-generated anagram solution during pain measurement. We used this design in order to have participants in the control condition self-generate a word (to ensure comparability across conditions in terms of self-generating words/names) but then—as in a typical control condition—opted to show them a blank screen in between pain measurements.

## Results

*Test of Hypotheses.* An independent-samples *t*-test with condition (close brand relationship, control) as the between-subjects independent variable and physical pain as the dependent variable found a significant effect of condition on pain: participants in the close brand relationship condition exhibited a significantly lower level of pain ( $M = 11.14$ ,  $SE = 1.62$ ) than did participants in the control condition ( $M = 16.59$ ,  $SE = 1.97$ ),  $t(294) = 2.12$ ,  $p = .035$ ,  $d = .25$  (see panel B of figure 2).

*Effect of Sex.* Pain was regressed on sex (female). The effect of sex on pain was nonsignificant,  $p = .380$ .

## Discussion

Experiment 1b replicated and generalized the findings from experiment 1a, demonstrating that our findings are robust. Given the between-subjects design of experiment 1b, the possibility of demand effects is likely to be low or even nonexistent. In the following experiment, we wanted to rule out the possibility that participants were simply more distracted when confronted with their loved brand (close relationship condition) than when they looked at the fixation cross (control). Pain researchers have shown that visual stimuli can distract people from pain because they require more attentional capacity for processing compared to no visual stimulus (McCaul and Haugtvedt 1982). It thus seems possible that close brand relationships are effective pain insulators simply because brands capture and hold visual attention long enough to distract from pain (Pieters and Wedel 2004). Yet, if our account of brand relationship closeness holds true, we would expect that,

above and beyond mere distraction, close brand relationships possess additional clout in pain insulation. To rule out that close brand relationships insulate against pain merely because they are distracting, we designed experiment 2.

## EXPERIMENT 2: LOVED BRANDS ARE MORE EFFECTIVE IN INSULATING AGAINST PHYSICAL PAIN THAN MERE DISTRACTIONS

### Overview and Method

The goal of experiment 2 was twofold: first, we aimed to replicate the negative effect of close brand relationships on pain in a different context; second, we aimed to rule out the possibility that the effect obtained in experiments 1a and 1b was simply due to distraction. We used an established methodology for inducing pain, in which participants were asked to imagine the loss of a loved one (Twenge et al. 2001). Experiment 2 employed a mixed experimental design with condition (close brand relationship, distraction, control) as a between-subjects independent variable, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable.

*Participants.* Three hundred eight adult consumers from the general population (158 females,  $M_{\text{age}} = 35.62$  years,  $SE_{\text{age}} = .72$ ) were recruited from Amazon Mechanical Turk, provided consent by agreeing to a disclosure form, and returned complete useable responses in exchange for monetary compensation. Data collection rules were the same as described in experiment 1b.

*Procedures and Materials.* Participants were randomly assigned to one of three conditions. Participants in all conditions were asked to think of a living person they love, then to imagine the loss of this person, and finally to rate their felt physical pain. Pain<sub>T1</sub> was again measured on the six-point scale (Hicks et al. 2001) that displayed six different facial expressions ranging from relaxed (1) to hurting (6).

In the close brand relationship condition, participants were asked to self-generate a brand with which they have a love relationship (e.g., BMW, Nike, or Sonicare), write an essay about that brand, and write the name of the brand in a text input field. Participants were then shown that brand name for 10 seconds, after which they reported their pain again (same measure as described above; called Pain<sub>T2</sub>), as well as their age and sex.

In the distraction condition, procedures were identical, except that participants were exposed to an image of a chair with neutral valence for 10 seconds (the image was taken from the International Affective Picture System, IAPS, by Lang et al. 2008). The chair image has been



successfully used in prior pain research as a distraction stimulus (Master et al. 2009).

In the control condition, procedures were identical, except that participants were exposed to a blank screen for 10 seconds.

## Results

*Test of Hypotheses.* A repeated-measures analysis of variance with condition (close brand relationship, distraction, control) as a between-subjects independent variable, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable found a significant interaction effect between time and condition on pain,  $F(2, 305) = 53.30, p < .001, \eta_p^2 = .26$  (see panel B of figure 3). Both the direct effect of time on pain,  $F(1, 305) = 359.73, p < .001, \eta_p^2 = .54$ , and the direct effect of condition on pain,  $F(2, 305) = 32.34, p < .001, \eta_p^2 = .18$ , were significant. Independent-samples *t*-tests (see panel C of figure 2) revealed that participants in the close brand relationship condition exhibited a significantly greater decrease in pain between T1 and T2 ( $\Delta = -3.23$ ) than did participants in both the distraction condition ( $\Delta = -1.27$ ;  $p < .001, d = -1.10$ ) and the control condition ( $\Delta = -.97$ ;  $p < .001, d = -1.28$ ). The difference in pain insulation between the distraction and control conditions was not significant ( $p = .158$ ).

*Effect of Sex.* We conducted the same repeated-measures analysis of variance while also including sex as covariate, *ceteris paribus*. The direct effect of sex on pain was marginally significant,  $F(1, 304) = 2.85, p = .092, \eta_p^2 = .009$ . There was no qualitative difference in the other results, compared to not including sex in the model as a covariate.

## Discussion

Experiment 2 provided converging support for our hypothesis that close brand relationships insulate against pain. Replicating and extending results from experiments 1a and 1b, we showed that the identified effect is due to the close relationship with the brand and cannot simply be explained by distraction. One drawback of experiment 2 was that participants in the close brand relationship condition wrote an essay about their beloved brand, while participants in the other conditions did not. Experiment 4 will deal with this drawback by having participants in all conditions write essays about their brand. Further, in experiment 2, we did not provide participants with a specific definition of loved brands. Experiments 3 and 4 will provide concrete definitions of the meaning of loved brands and, therefore, provide a baseline for participants from which to self-generate their loved brand.

Importantly, in experiments 3–5 we addressed the question of what causes the additional pain insulation when one

is confronted with loved brands. If our account of brand relationship closeness holds true, we would expect that, above and beyond mere distraction, close brand relationships possess additional pain insulation properties. To further substantiate the notion that it is truly brand relationship closeness that is driving pain insulation, experiments 3–5 shed light on the question of what explains the effect of close brand relationships on pain.

## EXPERIMENT 3: ANTHROPOMORPHIZED LOVED BRANDS ARE MORE EFFECTIVE IN INSULATING AGAINST PHYSICAL PAIN THAN OBJECTIFIED LOVED BRANDS

### Overview and Method

The goal of experiment 3 was to provide a first test of our second hypothesis that the reason why loved brands insulate consumers against pain is that they elicit feelings of social connectedness with other humans. If this proposition holds true, then we would expect that anthropomorphized loved brands (i.e., brands for which human-like characteristics have been activated) are more effective in insulating against pain than objectified loved brands (i.e., brands for which functional features have been activated). We tested this idea using an established manipulation of brand anthropomorphism (Aggarwal and McGill 2012). We also introduced another pain induction by asking participants to recall and relive situations of *general* psychological pain, so as to broaden the focus from pain from the death of a loved one to other forms of pain. Experiment 3 employed a mixed experimental design with condition (anthropomorphized close brand relationship, objectified close brand relationship, control) as a between-subjects independent variable, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable.

*Participants.* Three hundred sixty-three adults from the general population (189 females,  $M_{\text{age}} = 35.89$  years,  $SE_{\text{age}} = .62$ ) were recruited from Amazon Mechanical Turk, provided consent by agreeing to a disclosure form, and returned complete useable responses in exchange for monetary compensation. Data collection rules were the same as described in experiment 1b. We omitted 18 duplicate responses while obtaining each subject's first response.

*Procedures and Materials.* Participants were randomly assigned to one of three conditions. As a cover story, we told participants in all conditions that the purpose of the study was to learn more about self-generated website design and that they would be asked to respond to a survey at the end of the study.

In the anthropomorphized close brand relationship condition, participants were first asked to read a definition of loved brands, adapted from Batra et al. (2012). Participants

read: “A loved brand is a brand that (1) you are willing to invest resources into, and for which you have a history of having done so; (2) has the ability to connect you to life’s deeper meanings and provide intrinsic rewards; (3) gives you a sense of positive attachment and an intuitive feeling of “rightness”; (4) gives you separation distress if the brand were to go away; (5) you have formed a long-term relationship with; (6) you have a positive attitude towards; and (7) you hold positive attitudes with high certainty and confidence.” Participants were then asked to self-generate a brand with which they have a love relationship (e.g., Amazon Prime, Guinness, or Zara), write an essay about that brand, and write the name of the brand in a text input field. Participants were then asked to imagine and write about the sort of person the brand would be if it came to life, in terms of personality, physical appearance, opinions, approach, profession, and conversational style (taken from Aggarwal and McGill 2012). Participants were finally asked to list the single most human-like characteristic of this brand, which was later shown to them in between pain measurements (e.g., “punctual” for Amazon Prime, “competent” for Guinness, and “confident” for Zara).

In the objectified close brand relationship condition, participants read the same definition of loved brands and were then asked to self-generate and write an essay about a brand they loved (e.g., Adidas, Google, or Ford). Participants were then instructed to write about different functional features and aspects of the brand (also taken from Aggarwal and McGill 2012). Participants were finally asked to list the single most functional feature of this brand, which was later shown to them in between pain measurements (e.g., “durability” for Adidas, “gmail” for Google, and “transportation” for Ford).

In the control condition, participants were first asked to unscramble a simple anagram (i.e., *onctanier* with the solution being *container*). We chose the word *container* because it describes a neutrally valenced product (Lang et al. 2008). Importantly, whereas participants in the other conditions were shown stimuli prior to the second pain rating, participants in control were *not* shown their self-generated word/name in between pain measurements. We used this design in order to have participants in the control condition self-generate a word (to ensure comparability across conditions in terms of self-generating words/names) but then—as in a typical control condition—opted to show them a blank screen in between pain measurements.

Pain induction procedures were different from those in our prior experiments. Here, we asked participants to first write about an actual painful situation in their lives and then to describe this painful situation in a single word. The one-word responses spanned a broad spectrum of human negative emotions (e.g., “anger,” “debilitating,” “hopelessness,” “horrific,” “ugly,” and “sad”). Participants were then shown their one-word responses and asked to reimagine their painful situations and then rate their pain on the

six-point facial expression scale (Hicks et al. 2001) used in experiments 1a and 2. Next, participants were then asked to wait for 10 seconds while they were shown their loved brand (anthropomorphized and objectified conditions) or not (control). Then, participants were shown their one-word brand descriptor (human-like or functional) and asked to rate their pain again. Age and sex were reported.

Two independent raters categorized the participants’ pain descriptions into three pain types: 55% of responses were categorized as social pain (i.e., pain from interpersonal relationships; MacDonald and Leary 2005), 33% were categorized as suffering (i.e., pain from general unpleasantness and aversion; Meerwijk and Weiss 2011), and 11% were categorized as spiritual pain (i.e., pain from insecurities based on beliefs, culture, or religion; Delgado-Guay et al. 2011). Interrater reliability was high and significant (Pearson’s  $r = .74$ ,  $p < .001$ ), and there was no qualitative difference in the main effects regardless of whether we included or excluded the different pain types as a covariate.

## Results

*Test of Hypotheses.* A repeated-measures analysis of variance with condition (anthropomorphized close brand relationship, objectified close brand relationship, control) as a between-subjects independent variable, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable found a significant interaction effect between time and condition on pain,  $F(2, 342) = 49.13$ ,  $p < .001$ ,  $\eta_p^2 = .22$ . Both the direct effect of time on pain,  $F(1, 342) = 206.92$ ,  $p < .001$ ,  $\eta_p^2 = .38$ , and the direct effect of condition on pain,  $F(2, 342) = 17.16$ ,  $p < .001$ ,  $\eta_p^2 = .09$ , were significant. Independent-samples *t*-tests (see panel A of figure 4) revealed that participants in the anthropomorphized close brand relationship condition exhibited a significantly greater decrease in pain between T1 and T2 ( $\Delta = -2.32$ ) than did participants in the objectified close brand relationship condition ( $\Delta = -.45$ ;  $p < .001$ ,  $d = -1.16$ ) and the control condition ( $\Delta = -.78$ ;  $p < .001$ ,  $d = -.97$ ). The difference in pain insulation between the objectified and control conditions was marginally significant ( $p = .071$ ).

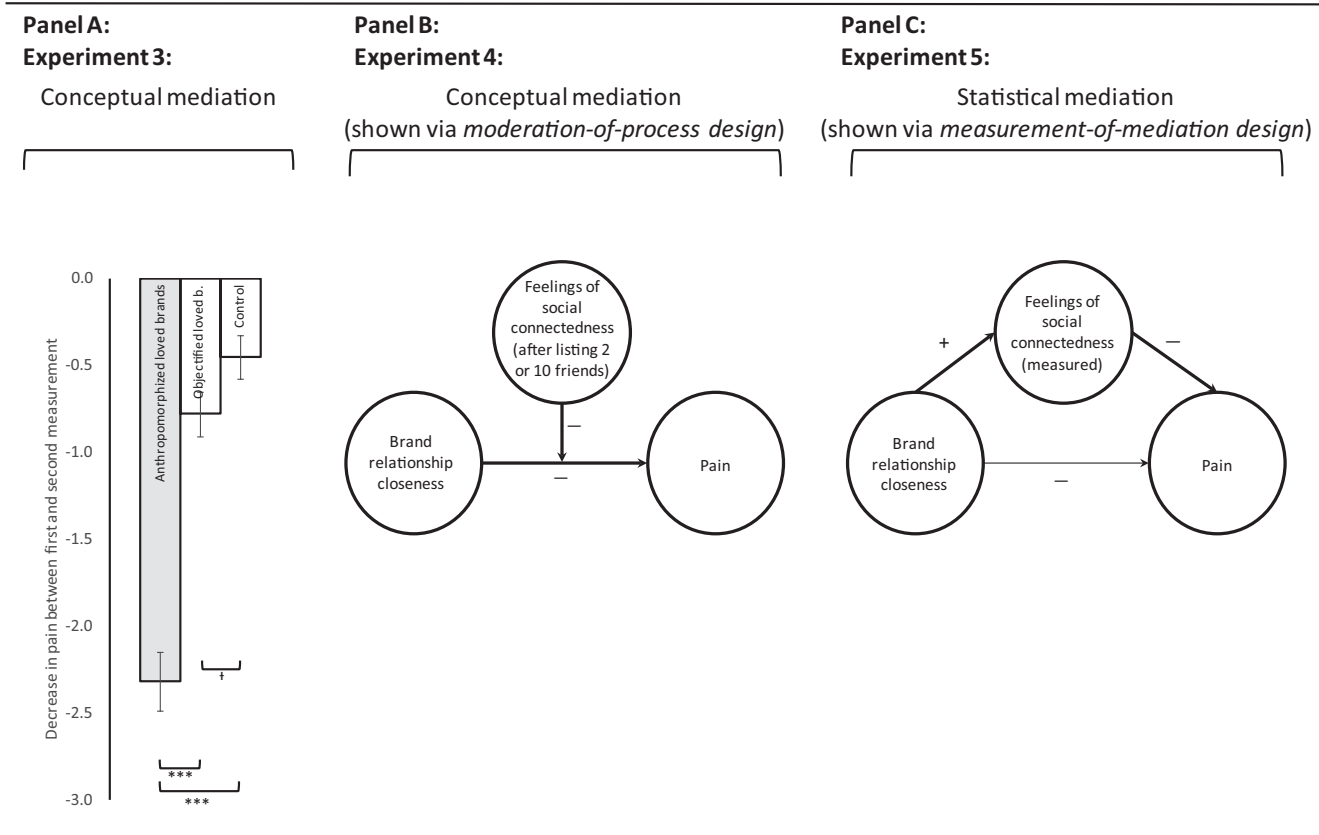
*Effect of Sex.* We conducted the same repeated-measures analysis of variance while also including sex as covariate, *ceteris paribus*. The direct effect of sex on pain was nonsignificant,  $F(1, 341) = .86$ ,  $p = .355$ . There was no qualitative difference in the other results, compared to not including sex in the model as a covariate.

## Discussion

Experiment 3 showed that close brand relationships for which human-like characteristics have been activated are much more effective in pain insulation than loved brands for which functional features have been activated. Interestingly,

FIGURE 4

EXPERIMENTS 3–5: MULTIMETHOD TESTS FOR MEDIATION BY FEELINGS OF SOCIAL CONNECTEDNESS



NOTE.—<sup>†</sup> $p > .05$ ,  $*p < .05$ ,  $**p < .01$ ,  $***p < .001$

once a loved brand has been credited with functional features but not human-like characteristics, it loses its pain-insulating qualities, highlighting a boundary condition. This finding provides an initial and important clue for our account that some form of social connectedness inherent in loved brands drives pain insulation. If this notion is indeed true, then people confronted with a loved brand should be more sensitive to measures and manipulations of feelings of social connectedness compared to controls. Experiment 4 tests this notion by manipulating our proposed mediator.

**EXPERIMENT 4: THINKING OF TWO FRIENDS (VS. 10) LOWERS THE PAIN-INSULATING EFFECT OF LOVED BRANDS**

**Overview and Method**

The goal of experiment 4 was to provide another test of our second hypothesis. We followed the logic of a

moderation-of-process design (Spencer et al. 2005) to test the proposed mediator by manipulating brand relationship closeness while also manipulating feelings of social connectedness. We expected that, if we boosted feelings of social connectedness after the first pain measurement, the effect of the close brand relationship on pain would be smaller compared to situations in which we did not boost such feelings. Experiment 4 employed a mixed experimental design with brand relationship (close, absent) and feelings of social connectedness (high, low) as between-subjects independent variables, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable.

*Participants.* Five hundred adults from the general population (247 females,  $M_{\text{age}} = 35.30$  years,  $SE_{\text{age}} = .56$ ) were recruited from Amazon Mechanical Turk, provided consent by agreeing to a disclosure form, and returned complete useable responses in exchange for monetary

compensation. Data collection rules were the same as described in experiment 1b.

**Procedures and Materials.** Participants were randomly assigned to one of four conditions. Participants in all conditions were first asked to read the definition of a loved brand (same as described in experiment 3) and were then asked to self-generate and write an essay about a brand they loved. We deliberately asked participants in all conditions to self-generate a loved brand at the beginning of the experiment to control for any priming effects (i.e., we wanted to avoid priming “love” by asking only participants in the close relationship condition to self-generate a loved brand). To manipulate the brand relationship, participants in the close relationship condition were shown their loved brand in between pain measurements, while participants in the absent brand relationship condition were not. To manipulate feelings of social connectedness, we asked participants in the high (low) connectedness condition to generate a list of two (10) friends and a similarity they share with each friend. We expected that listing 10 friends would be more difficult than listing two, which would cause participants to question their social connectedness. We also expected that asking about similarities between oneself and other people would increase feelings of social connectedness. Prior research supports the validity of this manipulation (Schwarz et al. 1991; Walton and Cohen 2007). To check whether this manipulation would indeed produce feelings of social connectedness, we adapted three items from previous work. First, we asked how difficult it was to generate the list of people (1 = not at all difficult; 7 = very difficult) (Walton and Cohen 2007). This item was reverse-coded. Second, we asked to what extent participants would use the term *we* to describe their relationships with the people they had listed (1 = not at all; 7 = very much) (Walton et al. 2012). This item measures a person’s sense of “oneness” with others (Cialdini et al. 1997). Third, participants were shown a succession of seven increasingly overlapping pairs of circles, with one circle in each pair labeled “self” and the other labeled “others” (Aron, Aron, and Smollan 1992), and were asked to select the pair that best described their relationships with the people they had listed. The average of these three items formed a reliable index of social connectedness ( $\alpha = .62$ ). Next, participants were exposed to the pain scenario and rated their pain in the same manner as in experiments 1a, 2, and 3. Age and sex were reported.

## Results

**Manipulation Check.** Several independent-samples *t*-tests revealed that our manipulation was successful. As expected, there was a significant difference on the social connectedness index between the “list two friends” condition ( $M_{\text{social connectedness index}} = 5.28$ ,  $SE = .07$ ) and the “list

10 friends” condition ( $M_{\text{social connectedness index}} = 4.41$ ,  $SE = .10$ ),  $t(472) = -7.19$ ,  $p < .001$ ,  $d = .66$ . Participants who were asked to list two friends found generating the list significantly less difficult ( $M_{\text{difficulty}} = 2.28$ ,  $SE = .11$ ) than those who were asked to list 10 friends ( $M_{\text{difficulty}} = 3.92$ ,  $SE = .15$ ,  $t(478) = -9.09$ ,  $p < .001$ ,  $d = .83$ ); they also described their friends more in terms of *we* ( $M_{\text{we}} = 5.38$ ,  $SE = .10$  vs.  $M_{\text{we}} = 5.01$ ,  $SE = .12$ ,  $t(478) = -2.41$ ,  $p = .02$ ,  $d = .22$ ) and perceived greater overlap between themselves and their friends ( $M_{\text{overlap}} = 4.74$ ,  $SE = .10$  vs.  $M_{\text{overlap}} = 4.14$ ,  $SE = .12$ ,  $t(473) = 4.06$ ,  $p < .001$ ,  $d = .37$ ).

However, in support of the cleanness of the manipulation, there was no significant difference on the social connectedness index between the loved brand ( $M_{\text{social connectedness index}} = 5.00$ ,  $SE = .09$ ) and control conditions ( $M_{\text{social connectedness index}} = 4.84$ ,  $SE = .09$ ),  $t(472) = -1.29$ ,  $p = .197$ . Participants in the loved brand condition did not find generating the list less difficult ( $M_{\text{difficulty}} = 2.94$ ,  $SE = .13$ ) than those in the control condition ( $M_{\text{difficulty}} = 2.99$ ,  $SE = .14$ ,  $t(478) = .24$ ,  $p = .81$ ) and they did not perceive a significantly greater overlap between themselves and their friends ( $M_{\text{overlap}} = 4.56$ ,  $SE = .11$  vs.  $M_{\text{overlap}} = 4.42$ ,  $SE = .11$ ,  $t(473) = -.95$ ,  $p = .35$ ). Yet, at a marginally significant level, they did describe their friends more in terms of *we* ( $M_{\text{we}} = 5.37$ ,  $SE = .10$  vs.  $M_{\text{we}} = 5.08$ ,  $SE = .11$ ,  $t(478) = -1.87$ ,  $p = .06$ ).

**Test of Hypotheses.** A repeated-measures analysis of variance with brand relationship (close, absent) and social connectedness (high, low) as between-subjects independent variables, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable found a significant interaction effect between time and brand relationship on pain,  $F(1, 478) = 86.60$ ,  $p < .001$ ,  $\eta_p^2 = .15$ . The interaction effect between time and social connectedness on pain was nonsignificant ( $p = .116$ ). Both the direct effect of time on pain,  $F(1, 478) = 252.59$ ,  $p < .001$ ,  $\eta_p^2 = .35$ , and the direct effect of brand relationship on pain,  $F(1, 478) = 21.88$ ,  $p < .001$ ,  $\eta_p^2 = .04$ , were significant, but the direct effect of social connectedness on pain was not ( $p = .108$ ). Most interestingly, there was a significant interaction effect between brand relationship and social connectedness on pain,  $F(1, 478) = 6.35$ ,  $p = .012$ ,  $\eta_p^2 = .01$ , showing that feelings of social connectedness lower the effect of close brand relationships on pain (see the conceptual model in panel B of figure 4). Indeed, post hoc comparison revealed that, whereas in the low connectedness condition the mean difference in pain between the close and absent brand relationship conditions was  $-1.71$ , it was only  $-.82$  in the high connectedness condition. This effect was also observed over time: the three-way interaction effect between time, brand relationship, and social connectedness on pain was also significant,  $F(1, 478) = 10.57$ ,  $p = .001$ ,  $\eta_p^2 = .02$ .



*Effect of Sex.* We conducted the same repeated-measures analysis of variance while also including sex as covariate, *ceteris paribus*. The direct effect of sex on pain was significant,  $F(1, 472) = 10.38, p = .001, \eta^2 = .02$ . There was no qualitative difference in the other results, compared to not including sex in the model as covariate.

## Discussion

Experiment 4 showed that a boost in feelings of social connectedness—after the pain induction and the first pain measurement and before the second pain measurement—reduces the effectiveness of close brand relationships in pain insulation. Results showed that, when feelings of social connectedness are generated independently of the close brand relationship, the loved brand loses some of its pain-insulating capacity. This finding provided another clue regarding whether the effect of close brand relationships on pain is mediated by feelings of social connectedness. In experiment 4, we had manipulated both the independent variable and the mediator in the same study. In experiment 5, we tested for statistical mediation by feelings of social connectedness by employing a measurement-of-mediation design (Spencer et al. 2005).

## EXPERIMENT 5: FEELINGS OF SOCIAL CONNECTEDNESS EXPLAIN THE EFFECT OF CLOSE BRAND RELATIONSHIPS ON PHYSICAL PAIN

### Overview and Method

The goal of experiment 5 was to manipulate close brand relationships and observe the effect on a measure of feelings of social connectedness. Experiment 5 employed a mixed experimental design with condition (close brand relationship, control) and measured feelings of social connectedness as between-subjects independent variables, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable.

*Participants.* Seven hundred eleven adults from the general population (353 females,  $M_{\text{age}} = 36.17$  years,  $SE_{\text{age}} = .44$ ) were recruited from Amazon Mechanical Turk, provided consent by agreeing to a disclosure form, and returned complete useable responses in exchange for monetary compensation. Data collection rules were the same as described in experiment 1b.

*Procedures and Materials.* Participants were randomly assigned to one of two conditions. In the close brand relationship condition, participants were asked to self-generate a brand with which they have a love relationship (e.g., EnergyStar, Nintendo, or Lazy-Boy), write an essay about that brand, and write the name of the brand in a text input

field. No specific definition of loved brand was provided to participants.

In the control condition, participants were given a filler task in which they were asked to solve one-digit addition and subtraction problems.

Then, participants in both conditions were given a second filler task in which they were asked how many sides eight different shapes had (e.g., rectangle = 4) (adapted from Christianson et al. 1991). On the next screens, participants were exposed to the pain scenario and reported their pain ratings in a manner identical to that used in experiment 2. To measure feelings of social connectedness, we utilized an established 20-item scale (Russell 1996), which was operationalized as a state measure (Russell, Peplau, and Cutrona 1980). Sample items were “How often do you feel part of a group of friends?” “How often do you feel close to people?” and “How often do you feel there are people you can turn to?” (four-point Likert-type scale ranging from 1 = never to 4 = always;  $\alpha = .93$ ). Age and sex were reported.

## Results

*Test of Hypotheses.* A repeated-measures analysis of variance with condition (close brand relationship, control) as a between-subjects independent variable, time (T1, T2) as a within-subjects independent variable, and physical pain as the dependent variable found a significant interaction effect between time and condition on pain,  $F(1, 709) = 80.78, p < .001, \eta_p^2 = .10$ . Both the direct effect of time on pain,  $F(1, 709) = 611.74, p < .001, \eta_p^2 = .46$ , and the direct effect of condition on pain,  $F(1, 709) = 48.82, p < .001, \eta_p^2 = .06$ , were significant. Independent-samples *t*-tests revealed that participants in the close brand relationship condition exhibited a significantly greater decrease in pain between T1 and T2 ( $\Delta = -2.29$ ) than did participants in the control condition ( $\Delta = -1.07; p < .001, d = -.68$ ).

*Effect of Sex.* We conducted the same repeated-measures analysis of variance while also including sex as covariate, *ceteris paribus*. The direct effect of sex on pain was significant,  $F(1, 708) = 9.89, p = .002, \eta_p^2 = .014$ . There was no qualitative difference in the other results, compared to not including sex in the model as covariate.

*Test for Statistical Mediation.* Because we included pain as a dependent variable in experiment 5, we were able to run a standard regression-based test for statistical mediation at a 95% confidence level with a bootstrap sample of 1,000 (Hayes 2008). We fit the model with condition (0 = control, 1 = close brand relationship) as the independent variable, feelings of social connectedness (measured from 1 to 4) as a possible mediating variable, and pain (measured from 1 to 6) as the dependent variable. The model with condition as an independent variable and feelings of

social connectedness as the dependent variable revealed a significant positive effect of condition on social connectedness ( $b = .08$ ,  $SE = .04$ ,  $t = 1.97$ ,  $p = .049$ , 95% C.I. [.00, .17]). The model with both condition and feelings of social connectedness as independent variables and physical pain as the dependent variable revealed a significant negative effect of condition on pain ( $b = -1.18$ ,  $SE = .13$ ,  $t = -8.77$ ,  $p < .001$ , 95% C.I. [-1.45, -.92]) and a significant negative effect of feelings of social connectedness on pain ( $b = -.45$ ,  $SE = .12$ ,  $t = -3.76$ ,  $p < .001$ , 95% C.I. [-.69, -.22]). In support of statistically significant mediation by feelings of social connectedness (see panel C of figure 4), the indirect effect of condition through social connectedness on pain was significant at a 95% confidence level ( $b = -.04$ ,  $SE = .02$ , 95% C.I. [-.09, -.004]).

## Discussion

Experiment 5 provided a statistical test of the mediating role of feelings of social connectedness, showing that feelings of social connectedness explain the effect of close brand relationships on pain. Experiment 5 thus supported our second hypothesis by way of a measurement-of-mediation design. Study 6 examined the brand love essays participants had written in our experiments to see what type of social connectedness they demonstrate.

## STUDY 6: LOVED BRANDS PROVIDE FEELINGS OF SOCIAL CONNECTEDNESS MOSTLY METAPHORICALLY AND INDIRECTLY

### Overview and Method

The goal of study 6 was to find out whether the loved brands in our experiments provided consumers with feelings of social connectedness either directly, indirectly, or metaphorically. Participants in experiments 2–5 were asked to write an essay about why they loved their self-generated brands, yielding a total pool of 1,124 essays. We employed two expert raters (marketing PhD students), who were instructed to read and classify each essay into the three categories. Web appendix B lists the instructions given to the two raters. Four essays were invalidated because they contained nonsense responses (e.g., one participant had copied and pasted our instructions instead of writing an essay). On the remaining 1,120 essays, the two raters agreed 98% of the time after discussion (1,105 essays).

### Results

Of the 1,105 essays, 487 were categorized as belonging to one of the three different types of social connectedness, whereas 618 were not sufficiently detailed to be categorized appropriately and/or referred to nonhuman

characteristics of the brand. Ratings revealed that when feelings of social connectedness arise when one is writing about loved brands, they mostly reflect metaphorical (45%) and indirect social connectedness (37%), and to a lesser extent direct social connectedness (17%).

For experiments 2–5, both the raters' categorizations and participants' pain scores were submitted to a one-way analysis of variance with type of social connectedness (metaphorical, indirect, or direct) as the between-subjects independent variable and pain difference scores as the dependent variable (note that the data from the control condition of experiment 4 were not included in this analysis because participants in the control condition were not subjected to the loved brand in between pain measurements). Results revealed nonsignificant differences in pain mitigation between the three types of social connectedness ( $p = .980$ ), implying that each type of social connectedness is similarly powerful in insulating against pain (across experiments 2–5, the pain differences scores were  $-2.02$  for metaphorical social connectedness,  $-2.06$  for indirect social connectedness, and  $-2.06$  for direct social connectedness).

## Discussion

Study 6 shows that in experiments 2–5, participants experienced feelings of social connectedness mostly after activating schemata of human-like traits inherent in the loved brand, recalling "relationships" with endorsers of the loved brand (both metaphorical social connectedness), and remembering brand incidents they had shared with loved others (indirect social connectedness). Study 6 thus provides new insight into the nuances of feelings of social connectedness stemming from close brand relationships.

## GENERAL DISCUSSION

Across seven studies, the current research demonstrated that contemplating close brand relationships insulates against physical pain. A multimethod, multistudy approach to the underlying process showed that close brand relationships prompt feelings of social connectedness, which in turn insulate consumers against pain. This article thus provides new insights into ancillary effects of brands and brand relationships by blending the notion of brand relationships with the idea that social connectedness is instrumental in pain mitigation.

Experiments 1a and 1b are the first to reveal that close brand relationships (compared to control) insulate against various forms of physical pain, such as the direct experience of cold water or remembered experiences of physical agony. This finding was both interesting and encouraging to us, especially because research in social psychology had previously failed to show that products possess the pain-insulating power of human caregivers. Experiment 2

showed that loved brands insulate against pain substantially more than a distracting stimulus, highlighting that it is brand relationships closeness that adds pain-insulating prowess. Experiments 3–5 provided a multistudy, multimethod test of the proposed underlying mechanism. Three experiments provided converging evidence that feelings of social connectedness underlie the effect. This is an interesting finding, because it endorses the idea that brands can function as effective “relationship partners” by signaling social connectedness (Fournier 1998). It is noteworthy that experiments 3–5 established mediation from different perspectives: experiment 3 provides conceptual mediation by showing that anthropomorphized loved brands are most effective. Experiment 4 provides a moderation-of-process test of mediation by showing that the ease of thinking of two friends (vs. the difficulty of thinking of 10 friends) lowers the pain-insulating effect of loved brands. Experiment 5 directly measures feelings of social connectedness and thus provides a measurement-of-mediation test.

### Core Theoretical Contributions

*On Materialism.* The present work set out to coalesce the intriguing body of work on psychological stressors and materialistic consumption (Dunn and Hoegg 2014; Rindfleisch et al. 2009). We showed that physical pain is likely to be a common denominator underlying a variety of causes of materialism, such as anxiety, grief, and loneliness. Furthermore, we offer an answer to the question of whether consumers can actively leverage materialism for coping with pain (Pieters 2013). We find that they can: forming brand relationships insulates against physical pain. This work thus demonstrated that materialism can offset physical pain and is not limited to psychological stressors.

Besides feelings of social connectedness being a mechanism explaining why loved brands mitigate pain (as was shown in this work), another mechanism related to materialism may exist. Because brands often represent tangible products, their consumption may trigger perceptions of engaging in material consumption, consciously or not. The question arises of whether this possible mechanism is a dual mechanism that works in parallel with feelings of social connectedness. Future researchers may want to address how perceptions of materialism and feelings of social connectedness possibly work together in pain mitigation.

*On Self-Brand Connections and Social Inclusion.* Our work contributes to and extends prior research arguing that consumers are more likely to develop self-brand connections if strong associations exist between the brand, a reference group, and the consumer’s self-concept (Escalas and Bettman 2003). We also expand on work revealing that lonely consumers establish a goal to belong (Loveland et al. 2010) and complement research showing that socially isolated consumers (vs. control) are more likely to

purchase products symbolic of group membership (Mead et al. 2011). Additionally, we show that consumers leverage the quasi-human interconnectedness elicited by loved brands for pain insulation.

*On Brand Relationships.* Almost 20 years ago, a now-well-known work on the conceptualization of brand relationships proposed that brand relationships can take different forms, with the closest forms being best friendships and committed partnerships (Fournier 1998). Our research extends the typology of brand relationships by demonstrating that brands, especially loved brands, can serve as quasi-human caregivers in their role as real pain arbitrators. Our work thus takes another step back from understanding “brand relationships” as just a metaphor and goes a step further toward demonstrating that brands function as human-like relationship partners.

*On Brand Attachment and Brand Anthropomorphism.* By introducing the notion of brands as quasi-human caregivers, we also contribute to prior work on brand attachment, which has drawn parallels to human attachment, such as the emotional sense of safety and security in parent–infant relationships (Park et al. 2010; Thomson et al. 2005). Our work extends this notion of brand attachment by arguing that a human attachment figure is likely shining through the brand metaphorically or indirectly. Indeed, research on anthropomorphism has argued that consumers meld humans and brands to make brands seem more human-like (Aggarwal and McGill 2012). Our work considers the consequences of such anthropomorphism by showing that consumers can leverage the human element of brands to alleviate their pain.

The question arises as to whether such anthropomorphism is evidence for a separate form of feelings of social connectedness, one that differs from the metaphorical, indirect, and direct social connectedness that we have identified in study 6. If such a form existed, then the brand would not be reminding the consumer of a celebrity or the beloved grandmother or even the sales rep, but would come alive like a person, serve as a relationship partner, and be viewed as a quasi-human entity (Fournier 1998). While it was impossible for us to filter out this fourth form of feelings of social connectedness based on the short brand love essays participants had generated, an interesting issue for future work to address would be distinguishing the four forms of feelings of social connectedness stemming from brands.

*On the Performance Implications of Brand Relationships.* Our work also contributes to research on the efficacy of brand relationships (John and Park 2016). Recent work on this topic has suggested that when consumers struggle with difficult tasks in their lives, brands can help them perform better (Park and John 2014). Our research extends the understanding of the efficacy of brand



relationships by demonstrating that brands can prompt feelings of social connectedness that make coping with difficult tasks (in our case, processing pain) much easier.

*On the Social Connectedness We Feel through Loved Brands.* The present work showed across three experiments that feelings of social connectedness explain why loved brands insulate against pain. Could loved objects and loved consumption experiences provide comparable levels of social connectedness and, therefore, also provide relief from pain? We think yes and no. Yes, loved objects, loved hobbies, or loved beach vacations could indeed provide a sense of social connectedness, *but only* if those objects, hobbies, and vacations hold specific human associations. If our favorite pillow reminds us of lying down next to our spouse, then yes. If our favorite hobby reminds us of engaging in it with dear friends, then yes. If our favorite beach reminds us of the last time we visited it with family, then yes. But, oftentimes, loved objects and loved experiences are frequently consumed in isolation (e.g., working out with one's dumbbells or going for a run alone). In those cases, the answer to the above question would likely be no: feelings of social connectedness would not arise, and quite possibly pain insulation would be less effective. Our experiment 4 supports this logic by showing that if loved brands are reduced to functional objects (despite being loved), they lose some of their pain-insulating power. Our logic is also supported by the longstanding notion that (loved) brands have added capability to carry human-related associations above and beyond objects (Keller 1993), because brands facilitate memory storage and retrieval more so than simple object descriptors (Keller 2003; Lynch, Marmorstein, and Weigold 1988). Taken together, because loved brands are more likely to carry non-object-related human associations such as information about user attributes (e.g., what type of person uses the product) and personal benefits (e.g., social approval and prestige) (Keller 1993), their pain-mitigating prowess is larger than that of unbranded loved objects and consumption experiences.

## Implications and Future Research

*Marketing Placebos versus Marketing Analgesics.* Our work speaks to consumer research on "marketing placebos," which has argued and shown that certain marketing actions (e.g., a higher price) can persuade consumers into the false expectation that they are receiving a better-performing product (e.g., higher-quality wine) than they actually are (Shiv, Carmon, and Ariely 2005). Conversely, the present work shows that consumers can use marketing actions (here, brands) as actual painkillers, or what we would call "marketing analgesics." In future studies, it would be interesting to compare the effectiveness of marketing analgesics to that of marketing placebos in terms of

pain reduction. Would a higher price lead to more or less pain (of paying), despite the marketing placebo's positive effect on the expectations about a product's performance? Would this effect be stronger or weaker for brands that are held close to the self?

*Sex and Gender Differences.* In the six experiments reported here, we controlled for sex. Mixed results were found. While two studies (experiments 4 and 5) revealed a significant effect of sex (female) on pain, the effect was nonsignificant or marginally significant in the other experiments. Future research could further delve into the role of sex and gender differences in pain experiences.

*Integrating Research on Brand Relationships with Research on Interpersonal Relationships.* This article built another bridge between research on brand relationships and research on interpersonal relationships. It is clear that both streams can inform each other, and useful parallels exist between how people form, maintain, and dissolve relationships with objects (brands) and with other humans (Reimann and Aron 2009). One area of investigation on interpersonal relationships that has been, thus far, mostly overlooked by brand relationship researchers is that of relationship breaches (Schilke, Reimann, and Cook 2013). What happens if a brand betrays one's trust? How fast do we recover from a brand's trust breach, if at all? Another stream of work on interpersonal relationships that may be worth investigating from the perspective of brand relationships is that of the effect of structural power differences on the relationship (Schilke, Reimann, and Cook 2015). How do brands that are perceived to be more powerful than the consumer influence consumer-brand relationships? For example, a consumer may perceive Mercedes-Benz to hold more structural power than he does, simply because it represents a century-old, highly innovative, and prestigious firm. How would this compare to that consumer's brand relationship with "Betsy's Bakery" from around the corner, which possesses equal or perhaps even lower structural power?

*Retail Therapy.* This work was not conceived to suggest that, when coping with stressors, consumers should seek brand relationships in lieu of human relationships, but rather to argue that consumers sometimes leverage their close relationships with brands to soothe their own distress. By doing so, our findings extend prior work on "retail therapy" by arguing and showing that distress regulation is not limited to sadness reduction by means of shopping (Rick, Pereira, and Burson 2014) but can work even in situations of severe distress through interaction with loved brands. Future work could investigate the role of contingencies of the link between brand relationships and pain to better understand when consumers are most likely to seek the therapeutic effects of brands.



## DATA COLLECTION INFORMATION

The first author designed the studies, analyzed the data, and wrote up the research, and the second and third authors designed and conducted the studies and analyzed the data. Data reported in experiment 1a were collected at Tecnológico de Monterrey in 2016. Data reported in experiments 1b–5 were collected via Amazon Mechanical Turk between 2013 and 2017. Ratings in study 6 were made at the University of Arizona in 2016 and 2017.

## REFERENCES

- Aaker, Jennifer L. (1997), "Dimensions of Brand Personality," *Journal of Marketing Research*, 34 (3), 347–56.
- Aggarwal, Pankaj and Ann L. McGill (2012), "When Brands Seem Human, Do Humans Act Like Brands? Automatic Behavioral Priming Effects of Brand Anthropomorphism," *Journal of Consumer Research*, 39 (2), 307–23.
- Ahuvia, Aaron C. (2005), "Beyond the Extended Self: Loved Objects and Consumers' Identity Narratives," *Journal of Consumer Research*, 32 (1), 171–84.
- Aron, Arthur, Elaine N. Aron, and Danny Smollan (1992), "Inclusion of Other in the Self Scale and the Structure of Interpersonal Closeness," *Journal of Personality and Social Psychology*, 63 (4), 596–612.
- Aron, Arthur, Elaine N. Aron, Michael Tudor, and Greg Nelson (1991), "Close Relationships as Including Other in the Self," *Journal of Personality and Social Psychology*, 60 (2), 241–53.
- Barber, Theodore X. and Barbara J. Cooper (1972), "Effects on Pain of Experimentally Induced and Spontaneous Distraction," *Psychological Reports*, 31 (2), 647–51.
- Barrett, Lisa Feldman, Batja Mesquita, Kevin N. Ochsner, and James J. Gross (2007), "The Experience of Emotion," *Annual Review of Psychology*, 58, 373–403.
- Bartels, Andreas and Semir Zeki (2000), "The Neural Basis of Romantic Love," *NeuroReport*, 11 (17), 3829–34.
- Batra, Rajeev, Aaron Ahuvia, and Richard P. Bagozzi (2012), "Brand Love," *Journal of Marketing*, 76 (2), 1–16.
- Block, Andrew R., Edwin F. Kremer, and Michael Gaylor (1980), "Behavioral Treatment of Chronic Pain: The Spouse as a Discriminative Cue for Pain Behavior," *Pain*, 9 (2), 243–52.
- Bohns, Vanessa K. and Scott S. Wiltermuth (2012), "It Hurts When I Do This (or You Do That): Posture and Pain Tolerance," *Journal of Experimental Social Psychology*, 48 (1), 341–5.
- Brown, Jennifer L., David Sheffield, Mark R. Leary, and Michael E. Robinson (2003), "Social Support and Experimental Pain," *Psychosomatic Medicine*, 65 (2), 276–83.
- Chou, Eileen Y., Bidhan L. Parmar, and Adam D. Galinsky (2016), "Economic Insecurity Increases Physical Pain," *Psychological Science*, 27 (4), 443–54.
- Christianson, Sven-Åke, Elizabeth F. Loftus, Hunter Hoffman, and Geoffrey R. Loftus (1991), "Eye Fixations and Memory for Emotional Events," *Journal of Experimental Psychology: Learning, Memory, and Cognition*, 17 (4), 693.
- Cialdini, Robert B., Stephanie L. Brown, Brian P. Lewis, Carol Luce, and Steven L. Neuberg (1997), "Reinterpreting the Empathy–Altruism Relationship: When One into One Equals Oneness," *Journal of Personality and Social Psychology*, 73 (3), 481–94.
- Cogan, Rosemary and Joseph A. Spinnato (1988), "Social Support During Premature Labor: Effects on Labor and the Newborn," *Journal of Psychosomatic Obstetrics & Gynecology*, 8 (3), 209–16.
- Delgado-Guay, Marvin O., David Hui, Henrique A. Parsons, Kathy Govan, Maxine De la Cruz, Steven Thorney, and Eduardo Bruera (2011), "Spirituality, Religiosity, and Spiritual Pain in Advanced Cancer Patients," *Journal of Pain and Symptom Management*, 41 (6), 986–94.
- DeWall, C. Nathan and Roy F. Baumeister (2006), "Alone but Feeling No Pain: Effects of Social Exclusion on Physical Pain Tolerance and Pain Threshold, Affective Forecasting, and Interpersonal Empathy," *Journal of Personality and Social Psychology*, 91 (1), 1–15.
- Droulers, Olivier and Safaa Adil (2015), "Perceived Gaze Direction Modulates Ad Memorization," *Journal of Neuroscience, Psychology, and Economics*, 8 (1), 15–26.
- Dunn, Lea and JoAndrea Hoegg (2014), "The Impact of Fear on Emotional Brand Attachment," *Journal of Consumer Research*, 41 (1), 152–68.
- Eisenberger, Naomi I. (2012a), "Broken Hearts and Broken Bones: A Neural Perspective on the Similarities between Social and Physical Pain," *Current Directions in Psychological Science*, 21 (1), 42–47.
- (2012b), "The Pain of Social Disconnection: Examining the Shared Neural Underpinnings of Physical and Social Pain," *Nature Reviews Neuroscience*, 13 (6), 421–34.
- Eisenberger, Naomi I., Matthew D. Lieberman, and Kipling D. Williams (2003), "Does Rejection Hurt? An fMRI Study of Social Exclusion," *Science*, 302 (5643), 290–2.
- Eisenberger, Naomi I., Sarah L. Master, Tristen K. Inagaki, Shelley E. Taylor, David Shirinyan, Matthew D. Lieberman, and Bruce D. Naliboff (2011), "Attachment Figures Activate a Safety Signal-Related Neural Region and Reduce Pain Experience," *Proceedings of the National Academy of Sciences*, 108 (28), 11721–26.
- Epley, Nicholas, Scott Akalis, Adam Waytz, and John T. Cacioppo (2008), "Creating Social Connection through Inferential Reproduction Loneliness and Perceived Agency in Gadgets, Gods, and Greyhounds," *Psychological Science*, 19 (2), 114–20.
- Escalas, Jennifer Edson and James R. Bettman (2003), "You Are What They Eat: The Influence of Reference Groups on Consumers' Connections to Brands," *Journal of Consumer Psychology*, 13 (3), 339–48.
- Fournier, Susan (1998), "Consumers and Their Brands: Developing Relationship Theory in Consumer Research," *Journal of Consumer Research*, 24 (4), 343–53.
- Glass, Thomas A. and George L. Maddox (1992), "The Quality and Quantity of Social Support: Stroke Recovery as Psycho-Social Transition," *Social Science & Medicine*, 34 (11), 1249–61.
- Goldberg, Daniel S. and Summer J. McGee (2011), "Pain as a Global Public Health Priority," *BMC Public Health*, 11 (1), 770.
- Hayes, Andrew F. (2008), *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-Based Approach*, New York: Guilford Press.
- Hicks, Carrie L., Carl L. von Baeyer, Pamela A. Spafford, Inez van Korlaar, and Belinda Goodenough (2001), "The Faces

- Pain Scale—Revised: Toward a Common Metric in Pediatric Pain Measurement,” *Pain*, 93 (2), 173–83.
- Hilgard, Ernest R. (1973), “A Neodissociation Interpretation of Pain Reduction in Hypnosis,” *Psychological Review*, 80 (5), 396–411.
- Jackson, Todd, Tony Iezzi, Hong Chen, Stephanie Ebnet, and Karen Eglitis (2005), “Gender, Interpersonal Transactions, and the Perception of Pain: An Experimental Analysis,” *Journal of Pain*, 6 (4), 228–36.
- John, Deborah Roedder and Ji Kyung Park (2016), “Mindsets Matter: Implications for Branding Research and Practice,” *Journal of Consumer Psychology*, 26 (1), 153–60.
- Keller, Kevin Lane (1993), “Conceptualizing, Measuring, and Managing Customer-Based Brand Equity,” *Journal of Marketing*, 57 (1), 1–22.
- (2003), “Brand Synthesis: The Multidimensionality of Brand Knowledge,” *Journal of Consumer Research*, 29 (4), 595–600.
- Kerns, Robert D., John Sellinger, and Burel R. Goodin (2011), “Psychological Treatment of Chronic Pain,” *Annual Review of Clinical Psychology*, 7, 411–34.
- Kulik, James A. and Heike I.M. Mahler (1993), “Emotional Support as a Moderator of Adjustment and Compliance after Coronary Artery Bypass Surgery: A Longitudinal Study,” *Journal of Behavioral Medicine*, 16 (1), 45–63.
- Lacoste-Badie, Sophie and Olivier Droulers (2014), “Advertising Memory: The Power of Mirror Neurons,” *Journal of Neuroscience, Psychology, and Economics*, 7 (4), 195–202.
- Lang, Peter J., Margaret M. Bradley, and Bruce N. Cuthbert (2008), *International Affective Picture System (IAPS): Affective Ratings of Pictures and Instruction Manual, Technical Report A-8*, NIMH Center for the Study of Emotion & Attention, University of Florida, PO Box 112766, Gainesville, FL 32611.
- Lastovicka, John L. and Nancy J. Sirianni (2011), “Truly, Madly, Deeply: Consumers in the Throes of Material Possession Love,” *Journal of Consumer Research*, 38 (2), 323–42.
- Loeser, John D. and Ronald Melzack (1999), “Pain: An Overview,” *The Lancet*, 353 (9164), 1607–9.
- Loveland, Katherine E., Dirk Smeesters, and Naomi Mandel (2010), “Still Preoccupied with 1995: The Need to Belong and Preference for Nostalgic Products,” *Journal of Consumer Research*, 37 (3), 393–408.
- Lynch, John G., Howard Marmorstein, and Michael F. Weigold (1988), “Choices from Sets Including Remembered Brands: Use of Recalled Attributes and Prior Overall Evaluations,” *Journal of Consumer Research*, 15 (2), 169–84.
- MacDonald, Geoff and Mark R. Leary (2005), “Why Does Social Exclusion Hurt? The Relationship between Social and Physical Pain,” *Psychological Bulletin*, 131 (2), 202–23.
- Master, Sarah L., Naomi I. Eisenberger, Shelley E. Taylor, Bruce D. Naliboff, David Shirinyan, and Matthew D. Lieberman (2009), “A Picture’s Worth: Partner Photographs Reduce Experimentally Induced Pain,” *Psychological Science*, 20 (11), 1316–18.
- McCaul, Kevin D. and Curt Haugtvedt (1982), “Attention, Distraction, and Cold-Pressor Pain,” *Journal of Personality and Social Psychology*, 43 (1), 154–62.
- McClelland, Laura E. and James A. McCubbin (2008), “Social Influence and Pain Response in Women and Men,” *Journal of Behavioral Medicine*, 31 (5), 413–20.
- Mead, Nicole L., Roy F. Baumeister, Tyler F. Stillman, Catherine D. Rawn, and Kathleen D. Vohs (2011), “Social Exclusion Causes People to Spend and Consume Strategically in the Service of Affiliation,” *Journal of Consumer Research*, 37 (5), 902–19.
- Meerwijk, Esther L. and Sandra J. Weiss (2011), “Toward a Unifying Definition of Psychological Pain,” *Journal of Loss and Trauma*, 16 (5), 402–12.
- Melzack, Ronald (1999), “From the Gate to the Neuromatrix,” *Pain*, 82 (1), S121–26.
- Melzack, Ronald and Patrick D. Wall (1965), “Pain Mechanisms: A New Theory,” *Science*, 150 (3699), 971–9.
- Merskey, Harold and N. Bogduk (1994), “Part III: Pain Terms, a Current List with Definitions and Notes on Usage,” in *Task Force on Taxonomy of the International Association for the Study of Pain*, ed. Harold Merskey and N. Bogduk, Seattle: IASP Press, 209–14.
- Mitchell, Laura A., Raymond A. R. MacDonald, and Eric E. Brodie (2004), “Temperature and the Cold Pressor Test,” *Journal of Pain*, 5 (4), 233–7.
- Montoya, Pedro, Wolfgang Larbig, Christoph Braun, Hubert Preissl, and Niels Birbaumer (2004), “Influence of Social Support and Emotional Context on Pain Processing and Magnetic Brain Responses in Fibromyalgia,” *Arthritis & Rheumatism*, 50 (12), 4035–44.
- Park, C. W., Deborah J. MacInnis, Joseph Priester, Andreas B. Eisingerich, and Dawn Iacobucci (2010), “Brand Attachment and Brand Attitude Strength: Conceptual and Empirical Differentiation of Two Critical Brand Equity Drivers,” *Journal of Marketing*, 74 (6), 1–17.
- Park, Ji Kyung and Deborah Roedder John (2010), “Got to Get You into My Life: Do Brand Personalities Rub Off on Consumers?” *Journal of Consumer Research*, 37 (4), 655–69.
- (2014), “I Think I Can, I Think I Can: Brand Use, Self-Efficacy, and Performance,” *Journal of Marketing Research*, 51 (2), 233–47.
- Passman, Richard H. (1977), “Providing Attachment Objects to Facilitate Learning and Reduce Distress: Effects of Mothers and Security Blankets,” *Developmental Psychology*, 13 (1), 25.
- Pieters, Rik (2013), “Bidirectional Dynamics of Materialism and Loneliness: Not Just a Vicious Cycle,” *Journal of Consumer Research*, 40 (4), 615–31.
- Pieters, Rik and Michel Wedel (2004), “Attention Capture and Transfer in Advertising: Brand, Pictorial, and Text-Size Effects,” *Journal of Marketing*, 68 (2), 36–50.
- Portenoy, Russell K. and Ronald M. Kanner (1996), *Pain Management: Theory and Practice*, Philadelphia: FA Davis Company.
- Reichert, Philipp, Antje B. M. Gerdes, Paul Pauli, and Matthias J. Wieser (2013), “On the Mutual Effects of Pain and Emotion: Facial Pain Expressions Enhance Pain Perception and Vice Versa Are Perceived as More Arousing When Feeling Pain,” *Pain*, 154 (6), 793–800.
- Reimann, Martin and Arthur Aron (2009), “Self-Expansion Motivation and Inclusion of Close Brands in Self: Towards a Theory of Brand Relationships,” in *Handbook of Brand Relationships*, ed. Joseph Priester, Deborah MacInnis and C. W. Park, New York: M. E. Sharpe, 65–81.
- Reimann, Martin, Raquel Castaño, Judith Zaichkowsky, and Antoine Bechara (2012), “How We Relate to Brands: Psychological and Neurophysiological Insights into Consumer–Brand Relationships,” *Journal of Consumer Psychology*, 22 (1), 128–42.

- Rick, Scott I., Beatriz Pereira, and Katherine A. Burson (2014), "The Benefits of Retail Therapy: Making Purchase Decisions Reduces Residual Sadness," *Journal of Consumer Psychology*, 24 (3), 373–80.
- Rindfleisch, Aric, James E. Burroughs, and Frank Denton (1997), "Family Structure, Materialism, and Compulsive Consumption," *Journal of Consumer Research*, 23 (4), 312–25.
- Rindfleisch, Aric, James E. Burroughs, and Nancy Wong (2009), "The Safety of Objects: Materialism, Existential Insecurity, and Brand Connection," *Journal of Consumer Research*, 36 (1), 1–16.
- Russell, Dan, Letitia A. Peplau, and Carolyn E. Cutrona (1980), "The Revised UCLA Loneliness Scale: Concurrent and Discriminant Validity Evidence," *Journal of Personality and Social Psychology*, 39 (3), 472–80.
- Russell, Daniel W. (1996), "UCLA Loneliness Scale (Version 3): Reliability, Validity, and Factor Structure," *Journal of Personality Assessment*, 66 (1), 20–40.
- Schilke, Oliver, Martin Reimann, and Karen S. Cook (2013), "Effect of Relationship Experience on Trust Recovery Following a Breach," *Proceedings of the National Academy of Sciences*, 110 (38), 15236–41.
- (2015), "Power Decreases Trust in Social Exchange," *Proceedings of the National Academy of Sciences*, 112 (42), 12950–55.
- Schwarz, Norbert, Herbert Bless, Fritz Strack, Gisela Klumpp, Helga Rittenauer-Schatka, and Annette Simons (1991), "Ease of Retrieval as Information: Another Look at the Availability Heuristic," *Journal of Personality and Social Psychology*, 61 (2), 195–202.
- Shiv, Baba, Ziv Carmon, and Dan Ariely (2005), "Placebo Effects of Marketing Actions: Consumers May Get What They Pay For," *Journal of Marketing Research*, 42 (4), 383–93.
- Shneidman, Edwin S. (1999), "The Psychological Pain Assessment Scale," *Suicide and Life-Threatening Behavior*, 29 (4), 287–94.
- Spencer, Steven J., Mark P. Zanna, and Geoffrey T. Fong (2005), "Establishing a Causal Chain: Why Experiments Are Often More Effective than Mediational Analyses in Examining Psychological Processes," *Journal of Personality and Social Psychology*, 89 (6), 845–51.
- Swaminathan, Vanitha, Karen L. Page, and Zeynep Gürhan-Canli (2007), "'My' Brand or 'Our' Brand: The Effects of Brand Relationship Dimensions and Self-Construal on Brand Evaluations," *Journal of Consumer Research*, 34 (2), 248–59.
- Thomson, Matthew, Deborah J. MacInnis, and C. Whan Park (2005), "The Ties That Bind: Measuring the Strength of Consumers' Emotional Attachments to Brands," *Journal of Consumer Psychology*, 15 (1), 77–91.
- Twenge, Jean M., Roy F. Baumeister, Dianne M. Tice, and Tanja S. Stucke (2001), "If You Can't Join Them, Beat Them: Effects of Social Exclusion on Aggressive Behavior," *Journal of Personality and Social Psychology*, 81 (6), 1058.
- von Baeyer, Carl L., Tiina Piira, Christine T. Chambers, Manuela Trapanotto, and Lonnie K. Zeltzer (2005), "Guidelines for the Cold Pressor Task as an Experimental Pain Stimulus for Use with Children," *Journal of Pain*, 6 (4), 218–27.
- Walton, Gregory M. and Geoffrey L. Cohen (2007), "A Question of Belonging: Race, Social Fit, and Achievement," *Journal of Personality and Social Psychology*, 92 (1), 82–96.
- Walton, Gregory M., Geoffrey L. Cohen, David Cwir, and Steven J. Spencer (2012), "Mere Belonging: The Power of Social Connections," *Journal of Personality and Social Psychology*, 102 (3), 513–32.
- Wiley, Cynthia and Rebecca A. Silliman (1990), "The Impact of Disease on the Social-Support Experiences of Cancer Patients," *Journal of Psychosocial Oncology*, 8 (1), 79–95.
- Younger, Jarred, Arthur Aron, Sara Parke, Neil Chatterjee, and Sean Mackey (2010), "Viewing Pictures of a Romantic Partner Reduces Experimental Pain: Involvement of Neural Reward Systems," *PLoS One*, 5 (10), e13309.
- Zhou, Xinyue, Kathleen D. Vohs, and Roy F. Baumeister (2009), "The Symbolic Power of Money: Reminders of Money Alter Social Distress and Physical Pain," *Psychological Science*, 20 (6), 700–6.