

The Symbolic Power of Money:  
Reminders of Money Alter Social Distress and Physical Pain

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## Abstract

People often get what they want from the social system, and that process is aided either by social popularity or by having money. Money can thus possibly substitute for social acceptance in terms of conferring the ability to obtain benefits from the social system. Moreover, past work has suggested that responses to physical pain and social distress share common underlying mechanisms. Six studies tested relationships among reminders of money, social exclusion, and physical pain. Interpersonal rejection and physical pain caused desire for money to increase. Handling money (compared to handling paper) reduced distress over social exclusion and diminished the physical pain of hot water. Being reminded of having spent money, however, intensified both social distress and physical pain.

What is the psychological meaning of money? The present investigation was based on the idea that money is a social resource.

As social and cultural animals, humans rely on each other (i.e., on their social group and its organizing systems) to get what they want and need. This social interdependency sustains a strong need to belong (Baumeister & Leary, 1995), because gaining acceptance by the group is important for obtaining the means of survival. However, in all but the most primitive cultures, money can substitute for social popularity: Money enables people to manipulate the social system to give them what they want, regardless of whether they are liked (Lea & Webley, 2006). In other words, either money or interpersonal inclusion enables people to obtain what they want from the social system.

The present research investigated the relationship between thoughts of money and interpersonal rejection. Recent work by Vohs, Mead, and Goode (2006) suggested that thoughts of money activate feelings of self-sufficiency: Such thoughts made participants less likely to offer or request help. One possible implication is that money provides a feeling of confidence that problems can be solved and needs can be met, and this confidence reduces the need to depend on others' approval. Thus, money is a social resource in which resides efficacious power to manipulate the social system for one's benefit.

Our first set of hypotheses was therefore that reminders of money could alter the impact of social events, especially acceptance and rejection. Even just the idea or feeling of having money should generate a broad sense of strength or efficacy. Hence,

feeling rejected (i.e., low in social approval) should increase the desire for money. Thoughts of having money should blunt the pain of being rejected. Thoughts of losing money, in contrast, might increase the pain of rejection: A person who lacks money is all the more dependent on the approval of others.

The second set of hypotheses speaks to underlying processes. Seminal writings by Panksepp (1998) proposed that when animals evolved to use social interaction as a strategy for achieving biological ends, they did not invariably develop new systems to respond to these new realities but instead adapted existing systems to respond to social events. Hence the pleasure/pain systems became attuned to issues such as social acceptance and rejection. Striking evidence for this by Eisenberger, Lieberman, and Williams (2003) showed that social rejection (ostracism) produced brain responses that resembled responses to physical pain. An important review by MacDonald and Leary (2005) found support for the link between social and physical pain, showing that social exclusion produced analgesic effects akin to the temporary numbing of physical pain that accompanies a bodily injury. Later work confirmed that social exclusion also causes humans to show temporary numbness to physical pain (DeWall & Baumeister, 2006).

Why might the idea of money mitigate physical pain? We propose that money, as an all-purpose social resource, activates a general sense of confidence, strength, and efficacy. Past work has established that strong self-efficacy beliefs improve the ability to withstand physical pain (Litt, 1988) as well as contributing to interpersonal success (Wheeler & Ladd, 1982).

Therefore, our second set of hypotheses linked money to physical pain. Pain should increase the desire for money. Thoughts of having money should reduce

feelings of pain caused by an external stimulus, and thoughts of spending or losing money should intensify pain.

## EXPERIMENT 1

If money can substitute for social acceptance, then thwarting the need to belong (via social rejection) should stimulate the desire for money. This was the hypothesis for Experiment 1. Twenge, Baumeister, DeWall, Ciarocco, and Bartels (2007) showed that rejected persons donated less money than others, which the researchers interpreted as decrease in prosocial motivations. But this behavior might simply reflect increased desire to have and keep money.

### *Participants*

Seventy-two undergraduate students (48 females) took part in same-sex groups of four. Participants were given eight RMB dollars (yuan) for participating. In all studies, participants were students at a Chinese university. No data were discarded.

### *Procedure*

Participants in each group first discussed getting-acquainted questions for five minutes and then were led to separate rooms. Each person indicated which group member he or she would like to work with on an upcoming dyad task. Then the experimenter returned to each participant and, by random assignment, said that either everyone (acceptance condition) or no one (rejection) had selected the participant and that this ostensible problem would preclude engaging in the dyad task.

Desire for money was measured in three ways. First, participants were asked to draw a (Chinese) RMB one-dollar coin from memory. Past work has confirmed that drawing larger coins is a sign of stronger desire for money (Bruner & Goodman, 1947).

Next, participants were given a list of seven pleasant things (e.g., sunshine, spring, chocolate, beach) and asked how many of them they would be willing to forego permanently in exchange for 10,000,000 RMB dollars (~US\$1,400,000). As they were getting ready to leave the experiment, another experimenter entered the room and asked for donations for an orphanage.

### Results and Discussion

Rejected participants drew larger coins,  $t(70) = 3.01$ ,  $p < .01$ , expressed willingness to forego more pleasures for money,  $t(70) = 2.08$ ,  $p < .05$ , and donated less money to the orphanage,  $t(70) = 2.54$ ,  $p < .02$ , than accepted participants. All three measures were significantly intercorrelated,  $.33 < r < .65$ , consistent with the assumption that they all measure the same variable. Thus, social rejection increased the desire for money.

### EXPERIMENT 2

The hypothesis was that priming the idea of physical pain would activate the desire for money, parallel to the findings of Experiment 1 concerning social rejection.

#### *Participants*

92 undergraduate students (64 females) took part in exchange for eight RMB.

#### *Procedure*

Participants came into the laboratory and first performed a word-completion task. By random assignment, half of them received 30 neutral word sets (e.g., stone, lunch), whereas in the pain condition, 10 of 30 words referred to physical suffering (e.g., headache, pain, sore). Then participants were given a sheet that showed ten coin sizes and were instructed to estimate which corresponded to the size of three actual coins.

Last, participants listed 10 things besides money that they valued in life and then were instructed to indicate which of them they would give up for RMB\$10m.

### Results and Discussion

Participants in the pain condition estimated coin sizes as significantly larger,  $t(90) = 3.08$ ,  $p < .005$ , and were willing to trade more valued things for money,  $t(90) = 3.49$ ,  $p = .001$ , compared to those in the neutral condition. The two measures were positively correlated,  $r(90) = .68$ ,  $p < .001$ . Thus, thoughts of physical pain increased desire for money.

### EXPERIMENT 3

Experiments 1-2 showed that social rejection and physical pain stimulated the desire for money. Our theory was that money, as a social resource, improves the implicit confidence that problems in general can be solved. If that is correct, then thinking about money ought to reduce suffering from such problems, including social exclusion.

#### *Participants*

Eighty-four undergraduate students (52 females) were randomly assigned among four conditions. Participants were given partial course credit for participating.

#### *Procedure*

First, participants were given what was described as a finger dexterity task. Participants in the money condition counted out 80 100-dollar bills from a stack provided by the experimenter, whereas participants in the paper condition counted out 80 pieces of paper. Next, all participants played a computerized ball-tossing game (Cyberball; Eisenberger et al., 2003). They were led to believe they played with three live

participants but in fact the computer simulated the other players. Initially the ball was tossed equally among the four players. In the normal play condition, this continued throughout. In the social exclusion condition, the simulated confederates stopped throwing the ball to the live participant after 10 throws. Afterward, participants rated their social distress using the Southampton Social Self-Esteem Scale (Sedikides, 2008). Sample items include, "I felt valued" and "I felt rejected."

### Results and Discussion

A manipulation check confirmed that participants in the exclusion condition estimated they received far fewer throws than those in the normal play condition,  $F(1, 80) = 1013.33, p < .001$ . Counting money versus paper had no effect on estimated number of throws received,  $F(1, 80) = 2.07, ns$ .

An ANOVA on social distress revealed three significant effects. Social exclusion increased distress,  $F(1, 80) = 18.28, p < .001$ . Counting money led to less distress than counting paper,  $F(1, 80) = 9.33, p < .005$ . The interaction was significant,  $F(1, 80) = 4.39, p < .05$ , as seen in Figure 1. Planned comparisons confirmed that counting money instead of paper significantly reduced distress in the exclusion condition ( $F(1, 80) = 13.17, p < .001$ ), but not in the normal play condition ( $F(1, 80) < 1, ns$ ). Thus, money reduced the distress and maintained self-esteem in the face of social exclusion.

Participants also completed a mood measure (Positive and Negative Affect Scale [PANAS], Watson, Clark, & Tellegen, 1988) after the manipulation. No effects of money or Cyberball condition on overall positive or negative affect were observed,  $F_s < 2.67, ns$ .

Given our hypothesis about money conferring a sense of confident efficacy, we analyzed results for the PANAS single item “strong.” There was a significant main effect of counting money on reports of feeling strong,  $F(1, 80) = 25.76, p < .001$ ; the main effect of pain condition and the interaction were not significant,  $F_s < 1$ . Participants who counted money as opposed to slips of paper reported feeling stronger ( $M_{money} = 3.45, SD = 0.67$ ;  $M_{paper} = 2.59, SD = 0.86$ ). The degree to which participants felt strong also correlated inversely with reports of distress regarding the Cyberball game,  $r(82) = -.32, p < .01$ . These results fit the theory that money operates as a resource, so that counting money helps buffer the impact of exclusion by making people feel stronger.

#### EXPERIMENT 4

Prior theories note that responses to social events use some of the same physiological mechanisms that respond to physical pain (MacDonald & Leary, 2005; Panksepp, 1998). If so, then counting money should reduce physical pain, in parallel to the results of Experiment 3.

##### *Participants*

Ninety-six undergraduate students (60 females) participated in exchange for partial course credit.

##### *Procedure*

Prior to coming to the laboratory, participants were randomly assigned to count money or paper. The counting task, the same as in Experiment 3, was first; then participants performed a pain sensitivity task. In the high pain condition, an assistant placed the participant’s hand on a structure to support and immobilize it and then immersed the left index and middle fingers in water three times, once at 43°C (baseline)

for 90sec, then at 50°C (very hot) for 30sec, then again at 43°C for 60sec. Participants' fingers in the moderate pain condition immersed only in the baseline hot (43°C) water. Afterward, they rated how painful this had been on a 9-point scale.

### Results and Discussion

An ANOVA on pain reports yielded three significant effects. First, pain reports were higher in the high pain than the moderate pain condition,  $F(1,92) = 57.35, p < .001$ , which can be regarded as a successful manipulation check. A test of our main hypothesis showed that pain reports were lower after counting money than paper,  $F(1,92) = 15.73, p < .001$ . The interaction was also significant,  $F(1,92) = 5.49, p = .02$ . Planned comparisons indicated that counting money significantly reduced pain in the high pain condition ( $F(1,92) = 19.91, p < .001$ ) but not in the moderate pain condition ( $F(1,92) = 1.32, p = .25$ ). (See Figure 2.)

After the manipulation, participants completed the PANAS as a mood measure. Scores on the positive and negative affect subscales did not vary as a function of money or pain condition or their interaction,  $F_s < 1.45, ns$ .

Again, reports on the item "strong" showed a main effect of money condition,  $F(1, 92) = 7.57; p < .01$ , such that participants who counted money reported feeling stronger than participants who counted paper ( $M_{\text{money}} = 3.46, SD = 1.03; M_{\text{paper}} = 2.83, SD = 1.19$ ) Neither the main effect of pain nor the interaction was significant,  $F_s < 2.15, ns$ . Comparing pain reports to reports of feeling strong evinced a negative and significant relationship, such that feeling strong inversely predicted how much pain participants reported,  $r(94) = -.30, p < .01$ .

### EXPERIMENT 5

Our theory held that the meaning of money as an acquired social resource accounts for its ability to reduce pain and distress. An alternative explanation of the results of Experiments 3-4 might attribute them to mere distraction. One way to tease apart these hypotheses would be to look at the effects of losing money. Thoughts of losing money should be at least as distracting as thoughts of gaining money, but the meaning of gaining money is the opposite of losing or spending it. Our theory would predict that thinking of outgoing money would increase distress from rejection, whereas the distraction hypothesis would predict the opposite (reduced distress).

### *Participants*

One hundred eight participants (76 females) were randomly assigned among four conditions. Participants were given partial course credit for participating.

### *Procedure*

Half of the participants were first assigned to list their monetary expenditures for the past 30 days. The rest were instructed to write about the weather conditions over the past 30 days. Then, all participants played Cyberball, experiencing either normal play or social exclusion conditions, as in Experiment 3. Also as in Experiment 3, participants completed the Southampton Social Self-Esteem Scale as a measure of social distress and the PANAS.

## Results and Discussion

An ANOVA revealed three significant effects on the social distress measure. Social distress was higher after listing monetary expenditures than after listing weather conditions,  $F(1,104) = 36.22, p < .001$ , and, replicating Experiment 3, after being excluded than after normal play,  $F(1,104) = 41.72, p < .001$ . The interaction was also

significant,  $F(1, 104) = 6.88, p = .01$ ; see Figure 3. Planned comparisons indicated that reflecting on money loss increased distress in both social exclusion ( $F(1, 104) = 37.34, p < .001$ ) and normal play conditions ( $F(1, 104) = 5.76, p < .03$ ), but the impact was significantly larger (hence the interaction) in the social exclusion condition.

Thus, thinking about having spent one's money increased the negative impact of social exclusion. This contradicts the alternative explanation based on distraction and supports the view that the impact of the idea of money reflects its value as a social resource.

Reports of overall positivity or negativity on the PANAS did not vary with either main effect or interaction,  $F_s < 1.50, ns$ . Bolstering our theory that having money makes people feel efficacious, self-ratings on the item "strong" were again predicted by the main effect of money condition,  $F(1, 104) = 5.03, p = 0.03$ ; no other effects were significant,  $F_s < 1$ . In Studies 3-4, thoughts of gaining money led to high feelings of strength. In Study 5, thoughts about having spent money made participants feel less strong ( $M = 2.24, SD = 0.73$ ) than participants who thought about the weather ( $M = 2.61, SD = .96$ ). Feeling strong was negatively related to feeling distress about the Cyberball game,  $r(106) = -.32$ .

## EXPERIMENT 6

The hypothesis for Experiment 6 was that money loss would exacerbate physical pain, just as it did social distress in Experiment 5.

### *Participants*

Ninety-six undergraduate students (56 females) were randomly assigned among four conditions. Participants received partial course credit for participating.

## *Procedure*

Participants first completed the manipulation of writing about expenses versus the weather, as in Experiment 5. Then they performed either the high pain or moderate pain water immersion task, as in Experiment 4, and afterward rated the degree of pain they experienced.

## Results and Discussion

As before, ANOVA revealed three significant effects. A manipulation check confirmed that participants' pain was worse in the high pain than the moderate pain condition,  $F(1,92) = 37.34, p < .001$ . As predicted, pain was also worse in the money loss condition than the weather condition,  $F(1,92) = 28.59, p < .001$ . The interaction was significant,  $F(1,92) = 5.25, p < .025$  (see Figure 4). Planned comparisons indicated that reflecting on monetary loss instead of the weather led to significantly worse pain in both conditions. However, this effect was significantly larger for the high pain group,  $F(1,92) = 29.17, p < .001$ , than for the moderate pain group,  $F(1, 92) = 4.67, p < .05$ .

Participants also reported their emotionality using the PANAS, which showed no differences as a function of money condition, pain condition, or their interaction,  $F_s < 2.65, ns$ . Once again, however, feeling strong was predicted by money condition,  $F(1, 92) = 3.70; p = .058$ . (Given that this finding should be considered a replication, a one-tailed  $p < .05$  could be invoked.) Participants who recounted their monetary expenditures reported feeling less strong ( $M = 2.44, SD = 0.92$ ) than participants in the weather-recounting condition ( $M = 2.81, SD = 0.98$ ). The main effect of physical pain and interaction effect were not significant,  $F_s < 1.15, ns$ . Reports of feeling strong again were negatively correlated with reports of pain,  $r(94) = -.29, p < .01$ .

## GENERAL DISCUSSION

Actually having money brings obvious benefits. The present findings suggest that even the mere idea of money can have benefits. The thought of money interacted with social and physical adversity to alter participants' subjective experience.

We found, first, that both social rejection and thoughts of physical pain led to increased desire for money. Second, we found that counting money, which presumably invoked the idea of getting and having money, reduced the suffering induced by Cyberball ostracism and real physical pain. Third, we showed that remembering having spent money made one more vulnerable to distress in response to social exclusion and physical pain.

All these findings fit the general principle that money operates as a social resource that confers a broadly strong feeling of being able to cope with problems and satisfy one's needs. In times of threat and adversity, resources are valued more than at other times (Hobfoll, 1989), presumably because resources improve one's overall ability to cope (Experiments 1-2). Getting or having resources reduces pain and suffering (Experiments 3-4); conversely, losing resources makes one more vulnerable, which is reflected in intensified suffering (Experiments 5-6).

We have emphasized the psychological and social meaning of money rather than its actual use and function, because in empirical fact money did not have any pragmatic utility for coping with the problems induced in these studies. Money could not actually purchase either more ball tosses during Cyberball or respite from the hot water. The fact that it produced subjective benefits without objective efficacy points to how people think and feel about money. Apparently, the mere thought of having a resource brings

psychological benefits, even without using the resource — indeed, even without actually having the resource, as the money counting procedure showed.

### *Alternative Interpretations*

The very success and power of our manipulations raise the question of what, exactly, is primed along with money. We did not find that overall mood or emotional state (measured by the PANAS) was affected by our manipulations. Rather, our findings were specific to social distress and physical pain (and feelings of strength).

Possible direct effects of money reminders were investigated by Vohs et al. (2006). They found that thinking of money had no impact on state self-esteem, nor did it alter self-construals as independent vs. interdependent (all  $F_s < 1$ , *ns*). Reminders of money also did not stimulate a desire for power.

Our theory was that money is a social resource that provides a broad capability to deal with problems and secure benefits. Hence the idea of having money should be associated with feelings of strength, efficacy, and confidence. Those feelings should therefore help buffer against social rejection and physical pain. Prior work has linked feelings of efficacy to pain tolerance, hardiness, resilience, and interpersonal success (Litt, 1988; McFarlane, Bellissimo, & Norman, 1995; Wheeler & Ladd, 1982).

During the development of the PANAS emotion measure (see Watson & Clark, 1994), a self-assurance subscale emerged from the long version, including items *bold*, *fearless*, *strong*, *confident*, and *daring*. The item “strong” represented that subscale on the final short measure. We repeatedly found significant shifts on that item, consistent with the theory of money as a social resource. Counting money made people feel

stronger, whereas recollections of having spent money made them feel weaker (as compared to control conditions). Moreover, these shifts in feeling strong versus weak predicted the distress caused by social exclusion and physical pain. These findings confirm the view that the primary effect of the idea of money is to promote general feelings of strength.

The link between thoughts of money and self-reported feelings of strength speaks to another potential alternative explanation, namely simple reward value. One might speculate that any pleasant stimulus (e.g., chocolate) might mitigate the impact of social exclusion and physical pain. But chocolate and other rewards do not necessarily boost a sense of strength. Other evidence speaks against the reward value hypothesis. Pleasantness alone did not account for the present results, because there was no broad pattern of overall positive affect. Furthermore, in the first two studies, participants specifically indicated a strong preference for money over chocolate and other pleasant things. Hence it seems likely that the present results are fairly specific to money. At most, another stimulus might produce similar effects if it could build a feeling of strength and ability to cope. It is doubtful, however, that many rewards can approach money in conferring strength.

### *Concluding Remarks*

One of the remarkable advances of human over animal social life is the reliance on abstract, symbolic means of influence. Money is prominent among these: Money enables people to move the social system to confer benefits. As social animals, humans are deeply sensitive to social acceptance and rejection, but as cultural animals (see

Baumeister, 2005), they are also sensitive to symbolic resources that might enable even rejected or unpopular persons to get what they need from the social system. The present findings indicate that the mere idea of money has considerable psychological power, enough to alter reactions to social exclusion and even to physical pain.

In each pair of studies in this investigation, social exclusion and physical pain yielded parallel effects. These findings add to the growing body of evidence that the human body's physiological systems for physical pain and trauma respond also to social, interpersonal events (MacDonald & Leary, 2005). That the thought of an abstract social resource (money) produces parallel reactions to social acceptance and physical pain suggests how profoundly the human mind and body are attuned to, and perhaps designed for, functioning in complex social and cultural systems.

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Figure 1. *Distress Ratings as a Function of Social Exclusion Versus Normal Play Conditions and Counting Money Versus Counting Paper Conditions, Experiment 3.*

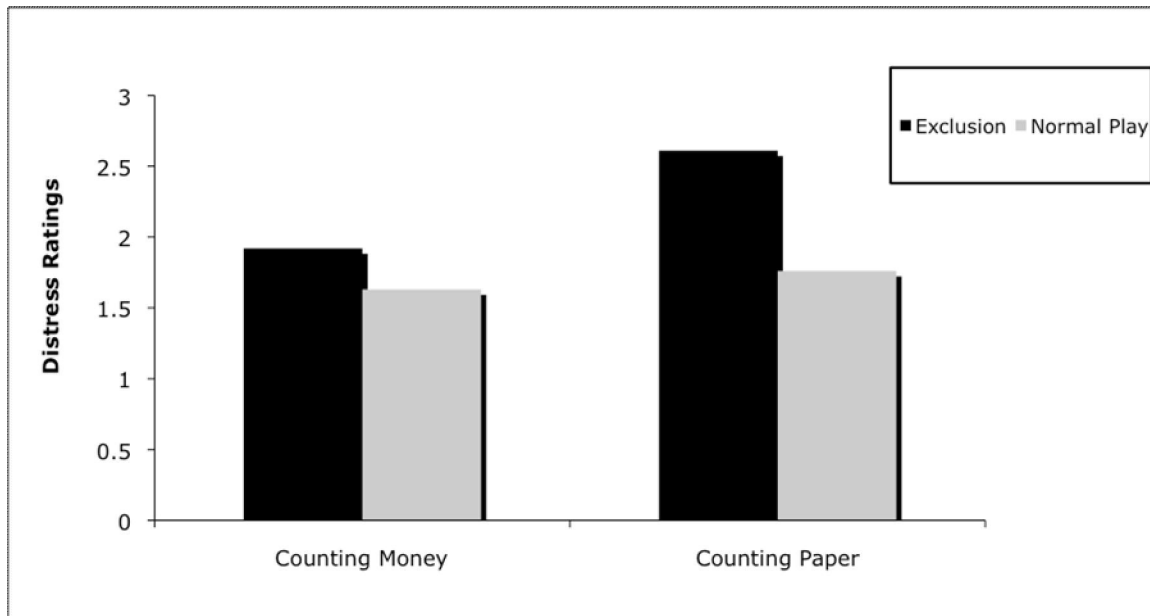


Figure 2. Pain Ratings as a Function of High Pain Versus Moderate Pain and Counting Money Versus Counting Paper Conditions, Experiment 4.

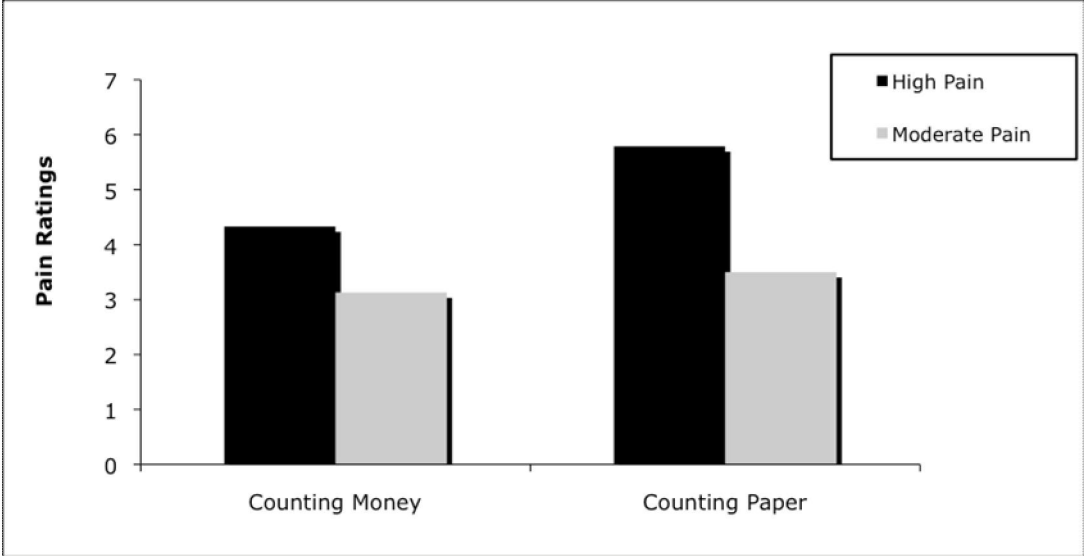


Figure 3. *Distress Ratings as a Function of Social Exclusion Versus Normal Play Conditions and Thinking about Monetary Loss Versus Weather Conditions, Experiment*

5.

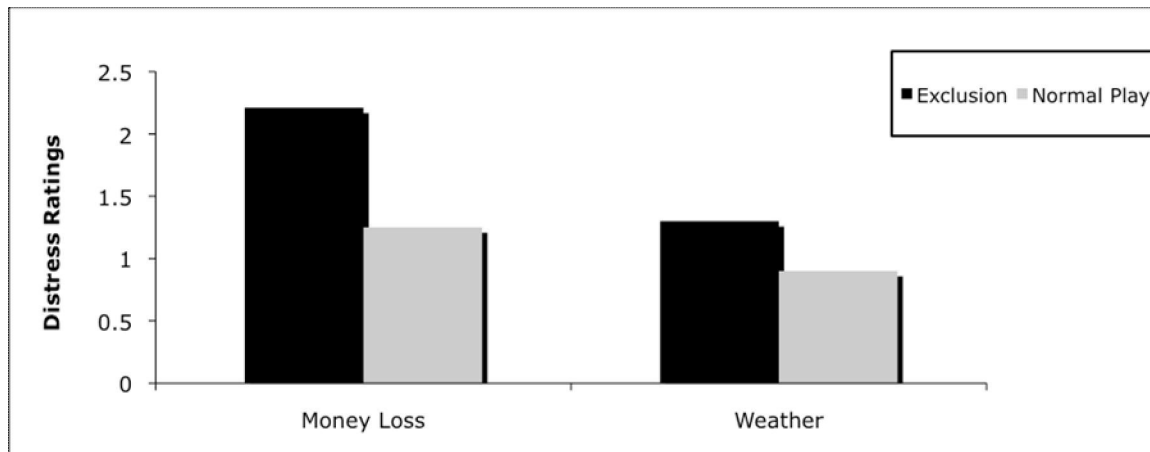
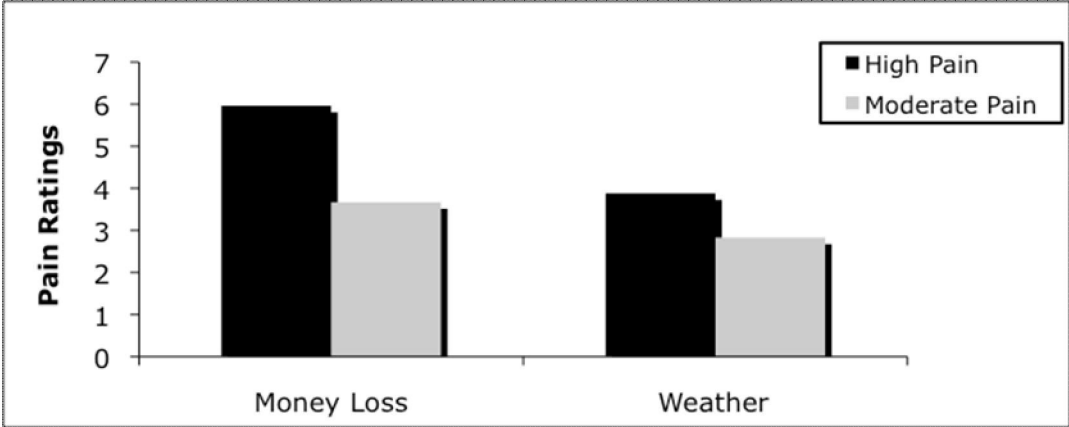


Figure 4. Pain Ratings as a Function of High Pain Versus Moderate Pain and Thinking about Monetary Loss Versus Weather Conditions, Experiment 6.



## AUTHOR NOTES

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