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The Psychological Consequences of Money

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Money has been said to change people's motivation (mainly for the better) and their behavior toward others (mainly for the worse). The results of nine experiments suggest that money brings about a self-sufficient orientation in which people prefer to be free of dependency and dependents. Reminders of money, relative to nonmoney reminders, led to reduced requests for help and reduced helpfulness toward others. Relative to participants primed with neutral concepts, participants primed with money preferred to play alone, work alone, and put more physical distance between themselves and a new acquaintance

People long have debated the effects of money on human behavior. Some scholars have pointed to its role as an incentive, insofar as people want money in order to trade it for prized goods or services (1, 2). Others, however, have deplored money for undermining interpersonal harmony (3). We propose that both outcomes emerge from the same underlying process: Money makes people feel self-sufficient and behave accordingly.

In this Report, "money" refers to a distinct entity, a particular economic concept. Consistent with other scholarly uses of the term (1), we use the term money to represent the idea of money, not property or possessions. Our research activates the concept of money through the use of mental priming techniques, which heighten the accessibility of the idea of money but at a level below participants' conscious awareness. Thus, priming acts as a nonconscious reminder of the concept of money.

We tested whether activating the concept of money leads people to behave self-sufficiently, which we define as an insulated state wherein people put forth effort to attain personal goals and prefer to be separate from others. The term as we define it does not imply a value judgment and encompasses a mixture of desirable and undesirable qualities, which may help explain the positive and negative consequences of money (4).

The self-sufficiency hypothesis encapsulates findings from extant research on money. For example, money brings about a state of self-sufficiency, then a lack of money should make people feel ineffectual. Previous research indicates that physical and mental illness after financial strain due to job loss is statistically mediated by reduced feelings of personal control (5). A recent theory by Lea and Webley (1), which characterizes money as both a tool and a drug, emphasizes that people value money for its instrumentality: Money enables people to achieve goals without aid from others. Therefore, we predicted that reminders of money would lead to

changes in behavior that suggest a feeling of self-sufficiency. When reminded of money, people would want to be free from dependency and would also prefer that others not depend on them.

In Experiment 1, participants were randomly assigned to three conditions. In two conditions (play money and money prime), participants were reminded of money; control participants were not reminded of money (6). All participants first completed a descrambling task (7), which activated neutral concepts (control and play money) or money (money prime). The descrambling task consisted of 30 sets of five jumbled words. Participants created sensible phrases using four of the five words. In the control and play-money conditions, the phrases primed neutral concepts (e.g., "cold it desk outside is" became "it is cold outside"). In the money-prime condition, 15 of the phrases primed the concept of money (e.g., "high a salary desk paying" became "a high-paying salary"), whereas the remaining 15 were neutral phrases (6). Participants in the play-money condition were primed with money by a stack of Monopoly money in their visual periphery while completing the neutral descrambling task.

Next, participants were given a difficult but solvable problem that involved arranging 12 disks into a square with five disks per side. As the experimenter exited the room, he offered that he was available to help if the participant wanted assistance. Persistence on the problem before asking for help was the dependent measure (8).

As predicted, participants who were reminded of money (play money and money prime) worked longer than control participants before requesting help [$F(2,49) = 3.73, P < 0.04$; mean (M) money prime = 314.06 s, $SD = 172.79$; M play money = 305.22 s, $SD = 162.47$; M control = 186.12 s, $SD = 118.09$]. The two money conditions did not differ from each other [$t(49) < 1$], but each was significantly different from the control group [money prime versus control: $t(49) = 2.44, P < 0.02$; Cohen's $d = 0.86$; play money versus control: $t(49) = 2.30, P < 0.03$; Cohen's $d = 0.84$]. Percentages of participants who requested help are shown in Fig. 1A.

In Experiment 2, we made two key changes to increase the generalizability of the findings of Experiment 1. First, we equated status differences between the would-be helper and the participant to ensure that differences in requests for help in Ex-

periment 1 were not due to differential sensitivity to the experimenter's higher status. The second change was to the manipulation of the money prime. We hypothesized that money primes are unlikely to activate the idea of meager finances – rather, monetary wealth is probably what is activated. This reasoning suggests that directly reminding people of meager finances will not lead to the same effects as reminders of financial affluence, which we tested systematically in Experiment 2.

Participants were randomly assigned between two manipulations; one condition activated the idea of an abundance of money (high money) and the other activated the idea of restricted amount of money (low money). Participants first read aloud an essay in front of a video camera. Participants in the high-money condition read about growing up having abundant financial resources, whereas low-money participants read about growing up having meager resources. Afterward, all participants were given the opportunity to ask for help.

The indicator of self-sufficiency was persistence on an impossible task before asking for help. The participant's job was to outline all segments of a geometric figure once and only once without lifting the pencil or retracing any segments. Unbeknownst to participants, the figure was unsolvable. After 2 min of working alone, the experimenter and a confederate (who was blind to the participant's condition) entered the room. The experimenter said

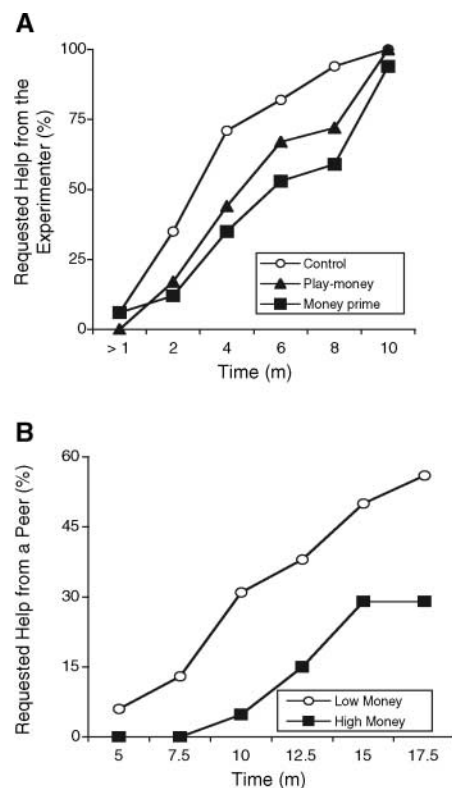


Fig. 1. Percentage of participants who asked for help as a function of money prime and length of time that had elapsed while working on (A) a difficult task (from Experiment 1) or (B) an unsolvable task (from Experiment 2).

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that the confederate was another participant who had just completed this experiment and therefore could be asked for help, if needed.

Results indicated that participants in the high-money condition worked significantly longer than participants in the low-money condition before asking for help [$t(35) = 2.03, P = 0.05$; Cohen's $d = 0.65$; M high money = 1058.48 s, $SD = 210.12$; M low money = 876.63 s, $SD = 334.42$]. Percentages of participants asking for help are shown in Fig. 1B. Thus, the effects of money did not depend on relative status differences between the participant and the helper.

In Experiment 3, we predicted that people who value self-sufficiency would be less helpful than others because they expect that each person will take care of him- or herself. Hence, we expected that participants primed with money would volunteer less time relative to control participants. Participants were randomly assigned to one of two conditions, one that primed money and one with neutral concepts. The priming manipulations were the money and neutral (control condition) descramble tasks from Experiment 1.

After the priming task, the experimenter explained that she was an undergraduate who was looking for help coding data and asked whether the participant would be able to help (9). She explained that each data sheet takes approximately 5 min to code. Participants were left alone to indicate how many data sheets, if any, they would be willing to code and also to provide their contact information.

Participants in the money condition volunteered to help code fewer data sheets than did participants in the control condition [$t(37) = 2.06, P < 0.05$; Cohen's $d = 0.66$] (Table 1). Translated into time, control condition participants volunteered an average of 42.5 min of their time, whereas participants in the money condition volunteered only slightly more than half that much (~25 min).

Experiment 3 showed that participants primed with money offered less help to the experimenter than did participants primed with neutral concepts. Yet, it may be that by asking for help for sometime in the future, the experimenter suggested that she was not in dire straits (in which case, she likely

would have asked for immediate aid); thus, money condition participants may have failed to realize that help was truly needed. Accordingly, it was important to move beyond promises of help to measuring real helping behavior.

In Experiment 4, two between-subject conditions were used to prime money or neutral concepts. Each participant completed the descramble tasks (from Experiment 1). Next, the participant was left alone to complete irrelevant questionnaires. Meanwhile, the experimenter reentered with a confederate (who was blind to the participant's priming condition) and introduced her as another participant. The experimenter explained that there was no space in the laboratory and therefore the confederate must share a room with the participant. After pretending to work for one minute, the confederate asked the participant to explain the directions for the task she was given because she did not understand what to do. Time spent helping the confederate was the measure of helping.

Participants who were primed with money were less helpful than participants not primed with money [$t(42) = 2.13, P < 0.04$; Cohen's $d = 0.63$]. The data showed that participants primed with money spent half as much time helping the confused confederate as did participants in the control condition (Table 1). Apparently, participants who were primed with money believed that the confederate should figure out on her own how to perform the task, as a self-sufficient person would do.

In Experiment 5, we wanted to give money-primed participants a helping opportunity that required no skill or expertise, given that the help that was needed in the two previous experiments may have been perceived as requiring knowledge or special skill to enact. The opportunity to help in the current experiment was quite easy and obvious, in that it involved helping a person who spilled a box of pencils.

Participants were randomly assigned to one of three conditions that were manipulated in two steps. Each participant first played the board game Monopoly with a confederate (who was blind to the participant's condition) posing as another participant. After 7 min, the game was cleared

except for differing amounts of play money. Participants in the high-money condition were left with \$4000, which is a large amount of Monopoly money. Participants in the low-money condition were left with \$200. Control condition participants were left with no money. For high- and low-money participants, the play money remained in view for the second part of the manipulation. At this step, participants were asked to imagine a future with abundant finances (high money), with strained finances (low money), or their plans for tomorrow (control).

Next, a staged accident provided the opportunity to help. A new confederate (who was blind to the participant's priming condition) walked across the laboratory holding a folder of papers and a box of pencils, and spilled the pencils in front of the participant. The number of pencils picked up (out of 27 total) was the measure of helpfulness.

As predicted, the money prime influenced helpfulness [$F(2, 32) = 4.34, P < 0.03$]. Participants in the high-money condition gathered fewer pencils than did participants in the low-money condition [$t(32) = 2.75, P < 0.02$; Cohen's $d = 0.81$] or those in the control condition [$t(32) = 2.13, P < 0.05$; Cohen's $d = 1.23$] (Table 1). Helpfulness did not differ between the low-money group and the control group [$t < 1$, not significant]. Even though gathering pencils was an action that all participants could perform, participants reminded of financial wealth were unhelpful.

Experiment 6 tested for the psychological effects of money by operationalizing helpfulness as monetary donations. Upon arrival to the laboratory, participants were given \$2 in quarters in exchange for their participation. The quarters were said to have been used in an experiment that was now complete; in actuality, giving participants quarters ensured that they had money to donate (9).

Participants were randomly assigned to one of two conditions, in which they descrambled phrases (as in Experiment 1) that primed money or neutral concepts. Then participants completed some filler questionnaires, after which the experimenter told them that the experiment was finished and gave them a false debriefing. This step was done so that participants would not connect the donation opportunity to the experiment. As the experimenter exited the room, she mentioned that the lab was taking donations for the University Student Fund and that there was a box by the door if the participant wished to donate. Amount of money donated was the measure of helping. We found that Participants primed with money donated significantly less money to the student fund than participants not primed with money [$t(38) = 2.13, P < 0.05$; Cohen's $d = 0.64$] (Table 1).

To convincingly demonstrate that money makes people self-sufficient, we tested the hypothesis in new contexts. The final experiments tested the effects of money on social intimacy, desire to engage in leisure activities alone, and preference to work alone. In Experiment 7,

Table 1. Helpfulness as a function of experimental condition in Experiments (Exp.) 3 to 6. The data are means \pm SD; higher numbers indicate greater helpfulness. Within each experiment, means from the money and no-money conditions are different from each other at $P < 0.05$.

| Exp. no. | Money condition | No-money condition | Dependent variable |
|----------|-------------------|--|--|
| 3 | 5.10 \pm 3.99 | 8.47 \pm 5.99 | Number of data sheets participants volunteered to code |
| 4 | 67.35 \pm 84.65 | 147.81 \pm 158.15 | Time spent helping a peer (seconds) |
| 5 | 18.00 \pm 1.96 | 20.30 \pm 1.77 (control) 19.72 \pm 2.28 (low money) | Number of pencils gathered |
| 6 | 0.77 \pm 0.74 | 1.34 \pm 1.02 | Monetary donations (in \$) |

participants were randomly assigned to one of three priming conditions. Participants sat in front of a computer while completing questionnaires. After 6 min, one of three screensavers appeared. Participants in the money condition saw a screensaver depicting various denominations of currency floating underwater (fig. S1). Participants in the fish condition saw a screensaver with fish swimming underwater (fig. S2). Participants in the no-screensaver condition saw a blank screen.

Afterwards, participants were told they would be having a get-acquainted conversation with another participant. Participants were asked to move two chairs together while the experimenter left to retrieve the other participant. The dependent measure was distance between the two chairs (10).

Participants primed with money placed the two chairs farther apart than did participants in the fish condition [$t(33) = 2.37, P < 0.05$; Cohen's $d = 1.07$] and the no-screensaver condition [$t(33) = 2.30, P < 0.05$; Cohen's $d = 0.85$] (Table 2). Chair distance did not differ between fish and blank screensaver conditions [$t(33) < 1$, not significant]. Hence, participants primed with money put more physical distance between themselves and a new acquaintance than participants not primed with money.

In Experiment 8, we tested whether money-primed participants would place a premium on being alone even when choosing leisure activities that could be enjoyed with friends and family. Participants were randomly assigned to one of three priming conditions. Participants first sat at a desk, which faced one of three posters, to complete filler questionnaires. In the money condition, the desk faced a poster showing a photograph of various denominations of currency (fig. S3). In two control conditions, the desk faced a poster showing either a seascape or a flower garden (figs. S4 and S5).

Subsequently, participants were presented with a nine-item questionnaire that asked them to choose between two activities. Within each item, one option was an experience that only one person could enjoy and the other option was for two people or more (e.g., an in-home catered dinner for four versus four personal cooking lessons).

Participants primed with money chose more individually focused leisure experiences than participants primed with either of the two neutral primes [$F(2, 58) = 4.04, P < 0.05$; money versus seascape: $t(58) = 2.75, P < 0.05$; Cohen's $d = 0.59$; money versus flowers: $t(58) = 2.10, P < 0.05$; Cohen's $d = 1.06$] (Table 2). The choice of activities did not differ between neutral conditions [$t(58) < 1$, not significant]. Thus, money primes lead people to be less social relative to those in nonmoney prime conditions.

In Experiment 9, a more rigorous test of the self-sufficiency hypothesis was tested: We asked whether people reminded of money would choose to work alone. Working on a task with a co-worker presumably means less work for each person, but the co-worker may prefer to rely on the participant, which would be an affront to self-sufficiency. Participants were given the option of working on a project with a peer or alone. Participants were randomly assigned to three priming conditions. As in Experiment 7, screensavers showing money, fish, or no screensaver primed money or non-money concepts. Participants were then told that their next task was an advertisement development task on which they could work alone or with a peer. Participants were left alone to indicate their choice.

Participants' desire to work with a peer was significantly affected by priming condition [$\chi^2(2, n = 37) = 10.10, P < 0.01$] (Table 2). Choosing to perform the task with a co-worker was reduced among money condition participants relative to participants in both the fish [$\chi^2(1) = 7.00, P < 0.05$; odds ratio = 11.25] and no-screensaver conditions [$\chi^2(1) = 8.22, P < 0.05$; odds ratio = 15.00]. There was no difference in choice between the fish and no-screensaver conditions [$t(34) < 1, P > 0.05$, not significant].

Nine experiments provided support for the hypothesis that money brings about a state of self-sufficiency. Relative to people not reminded of money, people reminded of money reliably performed independent but socially insensitive actions. The magnitude (11) of these effects is notable and somewhat surprising, given that our participants were highly familiar with money (12) and that our

manipulations were minor environmental changes or small tasks for participants to complete.

Research on the repercussions of studying economics dovetails nicely with our results. Frank, Gilovich, and Regan (13) reported that university students majoring in economics made self-interested moves in social dilemma games more often than students of other disciplines. Economics students also were more convinced than noneconomists that their competitors would make self-interested moves, a result that echoes the present thesis that money evokes a view that everyone fends for him- or herself.

The self-sufficient pattern helps explain why people view money as both the greatest good and evil. As countries and cultures developed, money may have allowed people to acquire goods and services that enabled the pursuit of cherished goals, which in turn diminished reliance on friends and family. In this way, money enhanced individualism but diminished communal motivations, an effect that is still apparent in people's responses to money today.

References and Notes

1. S. E. G. Lea, P. Webley, *Behav. Brain Sci.* **29**, 161 (2006).
2. A. Furnham, M. Argyle, *The Psychology of Money* (Routledge, London, 1998).
3. P. R. Amato, S. J. Rogers, *J. Marriage Fam.* **59**, 612 (1997).
4. The term self-sufficiency has been used in the psychological literature in two ways. One use (typically in research on recovery after injury) connotes a positive meaning of being free from needing others in order to effectively perform a task. The second use (typically in psychotherapy writings) takes on a discernibly negative meaning. Self-sufficiency in this case is considered a barrier to intimacy and is often seen in narcissistic personality disorders. Our use of the term incorporates both interpretations. We use self-sufficiency in part to suggest the autonomous agent who competently works toward personal goals, as well as the socially insensitive narcissist. We use the term not to suggest a stable trait (as in previous writings) but rather to signify a transitory psychological state brought on by reminders of money.
5. R. H. Price, J. N. Choi, A. D. Vinokur, *J. Occup. Health Psychol.* **7**, 302 (2002).
6. Materials and methods are available as supporting material on Science Online.
7. T. K. Srull, R. S. Wyer, Jr., *J. Pers. Soc. Psychol.* **37**, 1660 (1979).
8. R. S. Schwab, in *Fatigue*, W. F. Floyd, A. T. Welford, Eds. (Lewis, London, 1953), pp. 143–48.
9. J. M. Twenge, R. F. Baumeister, C. N. DeWall, N. J. Ciarocco, J. M. Bartels, *J. Pers. Soc. Psychol.*, in press.
10. C. N. Macrae, G. V. Bodenhausen, A. B. Milne, J. Jetten, *J. Pers. Soc. Psychol.* **67**, 808 (1994).
11. J. Cohen, *Psychol. Bull.* **112**, 155 (1992).
12. The majority of the participants in our experiments were raised in Canada, the United States, China, and Hong Kong (in decreasing order of prevalence).
13. R. H. Frank, T. Gilovich, D. T. Regan, *Ethol. Sociol.* **14**, 247 (1993).
14. This work benefited from financial support from the Social Sciences and Humanities Research Council and the Canada Research Chair Council, both to K.V. We thank research assistants A. Boyce, R. Chan, L. Chen, A. Connolly, S. Curtis, V. Ding, S. Gonzalez, A. Kaikati, S. Sartain, J. Suydam, A. Talbot, and N. Van Den Berg.

Supporting Online Material

www.sciencemag.org/cgi/content/full/314/5802/1154/DC1
 Materials and Methods
 Figs. S1 to S5
 References

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Table 2. Social distance preferences as a function of experimental condition in Experiments (Exp.) 7 to 9. The data are means \pm SD; higher numbers indicate preferences for greater social distance. In Experiments 7 and 9, the neutral 1 condition represents the fish screensaver condition, whereas the neutral 2 condition represents the no-screensaver condition. In Experiment 8, the neutral 1 condition represents the flower poster, whereas the neutral 2 condition represents the seascape poster. Within each experiment, means for the money condition differ from means in both neutral conditions at $P < 0.05$.

| Exp. no. | Money condition | Neutral 1 condition | Neutral 2 condition | Dependent variable |
|----------|--------------------|---------------------|---------------------|---|
| 7 | 118.44 \pm 41.63 | 79.48 \pm 30.43 | 80.54 \pm 47.06 | Physical distance between participant and partner (centimeters) |
| 8 | 4.00 \pm 1.20 | 2.82 \pm 1.00 | 3.10 \pm 1.80 | Number of solitary activity selections |
| 9 | 0.83 \pm 0.39 | 0.31 \pm 0.48 | 0.25 \pm 0.45 | Proportion of participants who opted to work alone |