

A Fresh Look on Money Priming: Feeling Privileged or Not Makes a Difference

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Abstract

Two studies demonstrated that subjective socioeconomic status moderates the effects of reminders of money on the endorsement of the socioeconomic system. Whether reminders of money increased or decreased system justification (Study 1) and the belief in a just world (Study 2) depended on participants' subjectively experienced standing in the social hierarchy. These findings were backed up by a small-scale meta-analysis across our entire data ($N = 365$). Hence, we also included a third study into the meta-analysis, in which the manipulation check indicated that the mental activation of money was comparably weak. This research offers new insights into the psychological mechanisms of money primes and reveals that interindividual differences, such as whether one feels privileged or not, can moderate the effects of money primes.

Keywords

money, priming, socioeconomic status, meta-analysis, generalizability

Introduction

Money plays an important role in our lives. Researchers have shown that, to some extent, personal wealth affects one's happiness (Diener & Seligman, 2004; Dunn, Aknin, & Norton, 2008), health and longevity (Fiscella & Franks, 1997; Mackenbach et al., 2005), and the ability to experience positive emotions (Quoidbach, Dunn, Petrides, & Mikolajczak, 2010). Moreover, besides *having* money, research in the last few years has revealed that even thinking about money can have tremendous effects on people's behavior and attitudes (Vohs, Mead, & Goode, 2006). Overall it seems that people who are subtly reminded of money "behave as if they can do just fine without others" (Lasaleta, Sedikides, & Vohs, 2014, p. 714). They tend to care less about others and focus more on their own personal needs and goals (Vohs et al., 2006; Vohs, Mead, & Goode, 2008). Findings that being reminded of money made people more accepting of social inequality (Caruso, Vohs, Baxter, & Waytz, 2013) would fit this general tendency. Caruso and colleagues (2013) claim that money serves as a symbol (i.e., as a reminder) of free-market capitalism and should lead people to endorse such free-market systems and more generally the existing free-market system in the United States. Accordingly, these authors found higher scores on the System Justification Scale (Kay & Jost, 2003) and the Belief in a Just World (BJW) Scale (Rubin & Peplau, 1975) among U.S. participants who had been reminded of money.

In the present article, we take another look at the theoretical assumptions that stimulated this research and derive more differentiated hypotheses. In this respect, it may be interesting to note that other studies could not replicate the original findings

(Klein et al., 2014; Rohrer, Pashler, & Harris, 2015). Indeed, according to our reasoning, the effect may strongly vary depending on participants.

The Present Research

An established finding of money priming is that reminders of money lead to a focus on the self and one's personal advantages (see: Vohs, 2015). Money reminded participants exert more effort on their current tasks (e.g., Boucher & Kofos, 2012; Mogilner, 2010) and are more concerned with their own compared to others' benefits (Gąsiorowska & Hełka, 2012; Reutner & Wänke, 2013). They are also more likely to behave unethically in order to achieve money or other goals (Gino & Mogilner, 2014; Kouchaki, Smith-Crowe, Brief, & Sousa, 2013). In summary, while neglecting others' interests, it appears that money evokes a bias for personal concerns and self-interest (Gino & Pierce, 2009; Kouchaki et al., 2013; Vohs et al., 2006, 2008).

Thus, when money motivates to pursue personal benefits, one should be more likely to evaluate a system according to the extent it serves one's personal needs. In other words, those who think they profit from the existing socioeconomic system

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should be more likely to approve of it when reminded of money. Accordingly, those who feel less advantaged by the existing system should be less likely to support it when reminded of money. Socioeconomically unprivileged people face tougher challenges (Dohrenwend, 1973; Johnson & Krueger, 2006) and have fewer coping resources (McLeod & Kessler, 1990) than their more advantaged counterparts. More importantly, people with a better education, more money, and better jobs benefit from free-market systems, whereas people with less education and money suffer from them compared to more egalitarian systems (Esping-Andersen, with Gallie, Hemerijck, & Myles, 2002).

We would therefore predict that whether reminders of money lead to higher endorsement of the U.S. socioeconomic system depends on who is asked. We expect that an individual's perceived standing in the social hierarchy (i.e., subjective socioeconomic status [subjective SES]) moderates the effect of money on the justification of the prevailing socioeconomic system. Because reminders of money cause people to evaluate a system according to how well they are doing in it, individuals who see themselves as socioeconomically disadvantaged should be less inclined to justify the existing system. On the contrary, people who would view themselves more as the beneficiaries of the socioeconomic system should endorse the system after being reminded of money.

Even though indicators of an individual's objective SES form the basis of one's subjective SES (Demakakos, Nazroo, Breeze, & Marmot, 2008), they capture different conceptual dimensions (Brown-Iannuzzi, Lundberg, Kay, & Payne, 2015; Demakakos et al., 2008; Piff, Kraus, Côté, Cheng, & Keltner, 2010). We emphasize that it is the subjective experience of one's standing in the social hierarchy that influences feelings of being privileged or disadvantaged.

We conceptually replicated two experiments by Caruso and colleagues (2013) and assessed system justification as a function of money priming. Critically, different from the original studies, we used a broader sample in terms of its socioeconomic background and assessed participants' subjective SES.

Study 1

Method

Design and Participants

We measured subjective SES for half of the participants before the manipulation and for the other half after the dependent variable. Thereby we controlled for possible influences of the money prime on participant's subjective SES reported after the dependent variable as well as for a potential priming of money due to the assessment of subjective SES before the manipulation. This resulted in a 2 (prime: money vs. control) \times 2 (SES-order: before vs. after) design with subjective SES measured on a 10-point scale.

Participants were recruited through the online platform CrowdFlower. We predetermined our sample size with 130

(plus 20 participants buffer for possible dropout due to online recruitment) to arrive at a power of $1 - \beta > .80$, assuming a small to medium interaction effect ($f^2 = 0.0625$; $\alpha = .05$; 2-tailed). From 150 participants, 4 left no data and data from another 22 participants were excluded because they did not follow the instructions to create four-word phrases in the manipulation. The remaining 124 participants (62 males, 1 other) were on average 38 years old ($SD = 12.92$), 60.5% had a household income of less than USD\$50,000 per year, and 58.5% did not graduate from college. We exclusively recruited U.S. American participants in order to ensure the effectiveness of the semantic prime and due to the "America-centric version of the System Justification Scale" (Caruso et al., 2013, p. 304).

Materials and Procedure

Participants accessed the study online and proceeded to a word-descrambling task, which consisted of forming a grammatically correct four-word phrase out of five scrambled words. The money condition contained 15 money-related phrases (e.g., "one hundred dollar bill") and 15 control phrases (see Appendix A online; Vohs et al., 2006). Next, to measure the cognitive activation of money, participants worked on a word stem completion task in which they had to complete 15 word stems, 7 of which could be completed as money-related or neutral words (e.g., "ri-" as rich, rise, or ride; see Appendix C online; Vohs et al., 2006). Then participants completed the 8-item System Justification Scale (e.g., "American society needs to be radically restructured"; reverse coded; $\alpha = .78$; Kay & Jost, 2003), as adapted by Caruso et al. (2013; 1 = *strongly disagree*; 7 = *strongly agree*). Finally, participants reported demographic variables including measures for household income (Piff et al., 2010), political ideology, and religiosity.

To assess a person's subjective SES, participants completed an online version of the MacArthur Scale of subjective SES (Piff et al., 2010). Participants were instructed to imagine an image of a 10-rung ladder as representing where people stand in the United States, whereby the top rung represents the highest standing in the social hierarchy. Then individuals indicated on a 10-point scale where they see themselves on this ladder relative to others ($M = 5.66$, $SD = 1.98$; $r_{(\text{household income})} = .29$).

Results and Discussion

A *t*-test revealed that money-reminded participants created significantly more money words ($n = 58$, $M = 1.31$, $SD = 0.96$) than when not reminded of money ($n = 66$, $M = 0.77$, $SD = 0.78$), $t(122) = 3.44$, $p < .001$, $d = 0.62$, 95% confidence interval (CI) = [0.26, 0.98]. This effect was similar to previous studies using this method (Vohs et al., 2006) and not moderated by subjective SES, $b = 0.02$, $t(120) = 0.44$, $p = .66$, 95% CI = [-0.06, 0.10].

To test our moderation hypothesis, we regressed system justification on the prime ($-1 = \text{control}$, $1 = \text{money}$; mean centered¹), subjective SES ($1-10$; mean centered), SES-order

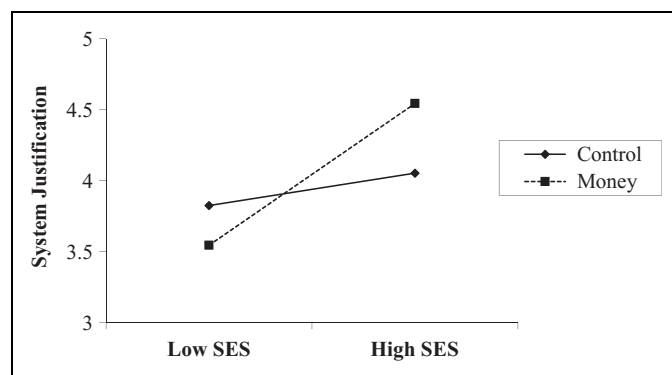


Figure 1. Estimated System Justification scores by condition (control vs. money) for lower (1 SD below the mean) and higher (1 SD above the mean) subjective SES (1–10) collapsed over SES-order (before manipulation vs. after dependent variable). SES = socioeconomic status.

(−1 = before manipulation, 1 = after dependent variable; mean centered), and all interaction terms. For participants with an average value in subjective SES, the money prime ($M = 4.03$, $SD = 1.11$) did not lead to stronger system justification than in the control condition ($M = 3.94$, $SD = 0.88$), $b = 0.05$, $t(116) = 0.56$, $p = .58$, 95% CI = [−0.12, 0.22]. Subjective SES significantly affected participants' system justification, $b = 0.14$, $t(116) = 3.26$, $p = .002$, 95% CI = [0.06, 0.23], with people higher in subjective SES reporting higher system justification. More importantly, the expected interaction of money and subjective SES significantly predicted system justification, $b = 0.11$, $t(116) = 2.46$, $p = .02$, 95% CI = [0.02, 0.19], $f^2 = .05$, [0, 0.12].^{2,3} This interaction was not affected by SES-order. Neither the three-way interaction, $b = -0.03$, $t(116) = 0.68$, $p = .50$, 95% CI = [−0.12, 0.06], nor the two-way interactions SES-Order × Prime, $b = 0.14$, $t(116) = 1.64$, $p = .11$, 95% CI = [−0.03, 0.31], SES-Order × Subjective SES, $b = 0.02$, $t(116) = 0.51$, $p = .61$, 95% CI = [−0.06, 0.11], nor the effect of SES-order were significant, $b = 0.01$, $t(116) = 0.09$, $p = .93$, 95% CI = [−0.16, 0.18]. Collapsing over SES-order, simple slope analysis (Hayes, 2013) revealed a small but not significant effect of subjective SES on system justification in the control condition, $b = 0.06$, $t(120) = 0.90$, $p = .37$, 95% CI = [−0.07, 0.19]. However, as shown in Figure 1, higher subjective SES led to an increase in system justification in the money condition, $b = 0.25$, $t(120) = 4.52$, $p < .001$, 95% CI = [0.14, 0.36]. In summary, whether reminders of money increased system justification depended on where people see themselves in the system. Whether subjective SES was assessed before the manipulation or after the dependent variable did not affect these results significantly. Moreover, the mental activation of money due to the money prime did not vary significantly across different levels of subjective SES.

Study 2

We conducted another study to broaden our findings by using a different measure (BJW Scale; Rubin & Peplau, 1975), which

had also been shown to be sensitive to money priming (Caruso et al., 2013; Study 2). The BJW describes a tendency to rationalize the status quo by blaming victims for their fate (Jost, Pelham, Sheldon, & Ni Sullivan, 2003). As such BJW is thought to be a system-justifying ideology to legitimize the current system (e.g., Jost & Hunyady, 2005) and the BJW Scale (Rubin & Peplau, 1975) is used as a measure for general system justification (e.g., Jost & Burgess, 2000; Oldmeadow & Fiske, 2007).

Again we predicted that being reminded of money should increase approval and belief in the system for those who are doing well in the system but less so for those who are less privileged. For exploratory reasons, we also tested whether thoughts of one's own versus other people's money would lead to different effects. On the one hand, one might assume that thinking about one's own money might possibly be more effective in inducing self-interest than thinking about other's money. This would suggest that participants' subjective SES affects their endorsement of the U.S. American system more, if they were reminded of their own rather than others' money. On the other hand, thoughts about other people's money might evoke greater subjective comparisons with others and thereby induce similar or greater effects with regard to just-world beliefs.

Method

Participants and Design

In addition to a control group, two money prime groups were run in order to realize the different perspectives (my money vs. their money). Similar to Study 1, we predetermined our sample size with 150 (including 20 participants buffer) to arrive at a power of $1 - \beta > .80$. From the initial CrowdFlower sample of 150 U.S. American participants, 9 left no data and data from 23 participants were excluded because they did not produce four-word phrases in the descrambling task. The remaining 118 participants (40 males, 2 other) were on average 40 years old ($SD = 14.03$), 51% had a household income of less than USD\$50,000 per year, and 65% did not graduate from college.

Materials and Procedure

Analogous to Study 1, participants accessed the study online and completed a modified version of the same descrambling task. Different from Study 1, we varied all personal pronouns in the 15 money-related phrases in order to evoke thoughts of one's own money in the my-money condition (e.g., "I received a raise") and to evoke thoughts of others' money in the their-money condition (e.g., "She received a raise"; see Appendix B online). In other words, whereas the money-related phrases in Study 1 contained mixed or no personal pronouns (e.g., "I," "we," "their," "he"), money-related phrases in the my-money condition contained only self-related (e.g., "I," "our," "my") and money-related phrases in the their-money condition contained only other-related (e.g., "he," "her," "their")

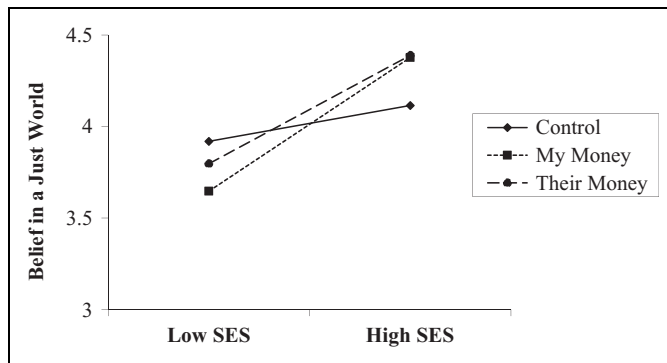


Figure 2. Estimated BJW scores by condition (control vs. my money vs. their money) for lower (1 SD below the mean) and higher (1 SD above the mean) subjective SES (1–10). BJW = Belief in a Just World; SES = socioeconomic status.

personal pronouns. Afterward participants completed the 20-item BJW Scale (e.g., “It is rare for an innocent to be wrongly sent to jail”; $\alpha = .75$; Rubin & Peplau, 1975) as an adapted version by Caruso et al. (2013; 1 = *strongly disagree*; 7 = *strongly agree*). Finally, participants reported their subjective SES ($M = 5.73$, $SD = 2.06$; $r_{\text{(household income)}} = .48$) and demographic variables similar to Study 1.

Results and Discussion

We used two orthogonal contrasts in a regression analysis. The first contrasted both “my” and “their” money groups versus the control group (0.5, 0.5, -1 ; mean centered) to test for a general money effect. The second contrasted “my” versus “their” money (-1 , 1, control = 0; mean centered) to test for differences between being reminded of one’s own versus others’ money. We further included the mean-centered subjective SES and both interaction terms.

Both contrasts did not reveal significant differences between conditions at the mean level of subjective SES. Participants in the money conditions ($M = 3.99$, $SD = 0.68$) did not report stronger just-world beliefs than in the control condition ($M = 4.05$, $SD = 0.66$), $b = 0.02$, $t(112) = 0.28$, $p = .78$, 95% CI = $[-0.14, 0.19]$. Furthermore, whether participants were primed with their own money (my-money condition; $M = 3.92$, $SD = 0.70$) compared to other people’s money (their-money condition; $M = 4.07$, $SD = 0.67$) did not alter the results between groups, $b = -0.04$, $t(112) = 0.55$, $p = .58$, 95% CI = $[-0.19, 0.11]$. However, higher subjective SES significantly led to stronger BJW, $b = 0.12$, $t(112) = 4.12$, $p < .001$, 95% CI = $[0.06, 0.18]$.

As shown in Figure 2, subjective SES moderated the general money effect on just-world beliefs: Even though significance did not quite reach conventional levels, the first interaction revealed that the effect of subjective SES was stronger in the money conditions compared to the control condition, $b = 0.08$, $t(112) = 1.87$, $p = .06$, 95% CI = $[0.00, 0.15]$, $f^2 =$

.03, $[0, 0.08]$, while the second interaction showed that the two money conditions did not differ significantly, $b = 0.02$, $t(112) = 0.46$, $p = .65$, 95% CI = $[-0.06, 0.09]$.⁴

Simple slope analysis revealed that the higher participants’ subjective SES the more they believed in a just world, both when reminded of their own money, $b = 0.18$, $t(112) = 3.23$, $p = .002$, 95% CI = $[0.07, 0.29]$, as well as when reminded of other people’s money, $b = 0.14$, $t(112) = 2.95$, $p = .004$, 95% CI = $[0.05, 0.24]$. Whereas in the control condition, participants’ subjective SES did not significantly affect their just-world beliefs, $b = 0.05$, $t(112) = 0.99$, $p = .32$, 95% CI = $[-0.05, 0.14]$. Hence, similar to Study 1, subjective SES marginally moderated the effect of money on the endorsement of the current system. Whether the prime activated thoughts of “my” or “their” money did not substantially alter the results. This implies that both manipulations evoked similar tendencies to act in accordance with one’s self-interest.

Meta-analysis

We conducted a small-scale meta-analysis (Cumming, 2012) to assess the robustness of the interaction effect of money and subjective SES on system justification. In a meta-analysis, the pooled estimate g is a far more trustworthy indicator for the true effect, since it is based on the entirety of the data (Braver, Thoemmes, & Rosenthal, 2014). Hence, we also included a third study, which was equivalent with Study 1 but with the BJW Scale (Rubin & Peplau, 1975) as a dependent variable (Appendix D online for details). We do not report that study individually in this article, because the manipulation check indicated a comparably small effect of the manipulation ($d = .32$, 95% CI = $[-0.04, 0.68]$, $t(121) = 1.77$, $p = .08$; see Study 1: $d = .62$). Presumably due to the less powerful manipulation, the interaction between money and subjective SES on BJW was not significant, $b = 0.05$, $t(114) = 0.92$, $p = .36$, 95% CI = $[-0.06, 0.16]$, $f^2 = .01$, $[0, 0.03]$. Even though the premises to find the expected interaction in this study were probably not equivalent, we nevertheless decided to incorporate the data to follow Braver, Thoemmes, and Rosenthal’s (2014) logic of cumulating evidence. According to this logic, a meta-analysis should include all studies because a greater sample size provides a better indicator of the true effect than each study by itself.

To calculate the effect size for the interaction effects, we computed f^2 of the interaction terms from the three studies and converted them into Hedges’ g as an unbiased estimate of the population effect size (Cumming, 2012, pp. 281–320). By using a weighted random-effects model, each experiment was weighted depending on the variance of its effect size. Moreover, this procedure enables to test, whether the discovered interaction effects in our studies were heterogeneous. Q , as a measure for heterogeneity, therefore, indicates whether the effects obtained across the studies differ due to sampling variability of the same underlying effect or whether the studies are

based on heterogeneous effect sizes (Borenstein, Hedges, Higgins, & Rothstein, 2009).

Our meta-analysis revealed that, across all three experiments the interaction effect was significant, $g = 0.32$, $p = .002$, 95% CI [0.11, 0.53]. Thus, although the manipulation in our third study was presumably too weak to cause a significant interaction effect with subjective SES, data of all three studies provide cumulative evidence for the interaction effect in the meta-analysis (see Braver et al., 2014). The effect was not heterogeneous across the three experiments, $Q(df = 2) = 1.27$, $p = .53$. This suggests, that we found similar effects across our three studies or, according to Braver et al. (2014), that the predicted interaction effect replicated across three studies.

Even though this meta-analysis across 365 participants provides substantial evidence for the predicted interaction, the inclusion of our third study remains debatable. One might argue, that due to the nonsignificant manipulation check, we cannot confirm that thoughts of money had been reliably activated in the money condition. This dichotomous logic implies that Study 3 should be excluded from our analysis. A meta-analysis that consisted only of Studies 1 and 2 ($N = 242$) still revealed a significant interaction effect, $g = 0.41$, $p = .002$, 95% CI [0.15, 0.66]. The variability of the effect size was not significant, $Q(df = 1) = 0.16$, $p = .69$.

General Discussion

Two experiments showed that participants' subjective SES moderates the effect of money reminders on the endorsement of the current socioeconomic system. When being reminded of money, participants with higher subjective SES tended to justify the existing socioeconomic system in the United States more strongly and believed more in the justness of its social outcomes than participants with lower subjective SES. A small-scale meta-analysis that included three experiments confirmed the general effect on the endorsement of the socioeconomic system and indicated no significant heterogeneity in the obtained effects.

We suggest that money cues do not generally lead to an increased approval of the current socioeconomic system but mainly for those who profit from the respective system. Three reasons may contribute to this. First, being reminded of money might make the economic aspects of a system more salient and more accessible as a base for the judgment. Second, thinking of money causes participants to more strongly focus on their own personal advantage (e.g., Gino & Mogilner, 2014; Kouchaki et al., 2013; Reutner & Wänke, 2013). Third, reminders of money lead to a focus on the self and should therefore make system justification less likely when it conflicts with self-interest (Jost et al., 2003). As a result, money-reminded participants base their judgments about the social and economic system more strongly on whether they benefit from this system or not. Those who do well in the system will show increased support and increased belief in its fairness, whereas those who sense that they have fallen behind will have a more critical view of the justness and legitimacy of the current system.

Although our results show consistently that subjective SES moderates the effect of money priming on the endorsement of the socioeconomic system, the correlational nature of the data poses a potential limitation. Only a manipulation of subjective SES, without activating the concept of money, would allow conclusive causal assumptions. A second shortcoming of this research is that we did not vary the type of money prime. Even though, the money scrambled sentence task is consistently used in the money priming literature (e.g., Boucher & Kofos, 2012; Caruso et al., 2013; Hansen, Kutzner, & Wänke, 2013; Jiang, Chen, & Wyer, Jr., 2014; Kouchaki et al., 2013; Vohs et al., 2006), we cannot rule out the possibility that the task activates alternative concepts such as economic inequalities. If so, then large parts of the research on money would be confounded with the activation of economic inequalities, which in turn would be possibly moderated by subjective SES. However, we find this to be unlikely. Assessing subjective SES before the manipulation (as in one condition of Study 1), should have activated thoughts of economic inequalities even in the control condition and therefore offset any effect of the descrambling task. This was not the case; we also found the interaction effect when we only considered those participants who reported their subjective SES before the manipulation, $b = 0.14$, $t(57) = 2.20$, $p = .03$, 95% CI = [0.01, 0.26].

It is also worth noting, that while corroborating studies that show effects of self-interest (Brown-Iannuzzi et al., 2015), our results seem to be at odds with some findings on system justification theory in which economically disadvantaged groups would be (at least moderately) more motivated to justify the socioeconomic system (see: Hunt, 2000; Jost et al., 2003). In our studies, however, participants' subjective SES in the control condition was slightly positive related to system justification ($r = .12$) and BJW ($r = .15$), which established a rather conservative test for our moderation hypothesis. This positive relationship is not surprising, since an inverse relationship between SES and system justification depends on many boundary conditions (Kay & Friesen, 2011) and is more likely when measured with unobtrusive measures that are embedded in large surveys (Jost, Pelham, & Carvallo, 2002; Jost et al., 2003) and when motives of self-interest are not salient (Jost, Banaji, & Nosek, 2004; Jost et al., 2003). In our studies system justification was assessed with explicit measures that were not embedded in other items. Consequently, Jost, Banaji, and Nosek (2004, p. 910) argue, it would be unwarranted to claim "that members of disadvantaged groups will always or even typically exhibit stronger support for the system than will members of advantaged groups."

Besides proposing a fresh look on money priming by suggesting that the effects may differ substantially depending on who is primed, as a side effect, our findings also offer conceptual implications for the recent debates about the replicability of money priming and perhaps priming in general (e.g., Asendorpf et al., 2013; Cesario, 2014; Locke, 2015). On the one hand, looking at the overall pattern, the present research further shows that the findings from Caruso and colleagues (2013) are difficult to replicate (see: Klein et al., 2014; Rohrer et al.,

2015). On the other hand, our research identified a moderator that may account for the effect found by Caruso et al. (2013, studies 1 and 2) if we assume that their participants were of relatively high subjective SES (students of an elite U.S. university with renowned prestige, education, and excellent job perspectives) compared to the replication samples. Note, however, that such tentative conclusions are only based on three conceptual replications and an educated guess about the subjective social standing of Caruso et al.'s participants. On a different note we also point to the variance in our manipulation checks, which suggests that procedures of priming money may not reliably activate thoughts of money. The robustness of the priming procedure is however different from the robustness of the effects given the prime works and both should be treated separately when evaluating research on money priming.

Be that as it may, more generally, we suggest not merely to look for whether an effect appears and replicates, but in the interest of scientific advance to strictly test the predictions that derive from theory and understand the conditions that moderate its occurrence (Cesario & Jonas, 2014; Locke, 2015; Wheeler & Berger, 2007). Interindividual differences such as subjective SES may help to account for controversial findings in the field and expand our understanding of the psychological effects of money in general. Interestingly, the mental activation of money may not necessarily lead to the same behavioral outcomes and judgments for different people. While being reminded of money may make the privileged endorse the status quo, it may cause the less privileged to challenge this status and question the foundations of society.

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Notes

1. As suggested by Hayes (2013), contrast variables throughout all studies were mean centered to provide estimates of the weighted average effects at the sample mean level of all other variables.
2. Controlling for religiosity (only in Study 1), age, gender, political ideology, and household income (see Caruso et al., 2013) did not significantly alter the results in both studies. The reported confidence intervals for f^2 are 95% one sided, because f^2 effect sizes cannot be negative.
3. When applying a more liberal dropout criterion that comprised participants who interrupted the study ($n = 7$; ≥ 19.1 min, i.e., upper quartile + 1.5 interquartile range) and nonnative speakers (6), the

interaction remained significant, $b = 0.11$, $t(103) = 2.29$, $p = .02$, 95% CI = [0.01, 0.20].

4. When applying a more liberal dropout criterion that comprised participants who interrupted the study ($n = 4$; ≥ 22.0 min, i.e., upper quartile + 1.5 interquartile range) and nonnative speakers (2) the first interaction was significant, $b = 0.09$, $t(106) = 2.15$, $p = .03$, 95% CI = [0.01, 0.18].

Supplemental Material

The online appendices are available at <http://spps.sagepub.com/supplemental>.

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