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# The Power of Peers: Prompting Savings Behavior Through Social Comparison

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## ABSTRACT

In 2 experimental studies (Study 1:  $n = 1,155$ ; Study 2,  $n = 630$ ), the authors used a social norms approach to promote savings behavior. Many people do not save enough for retirement, which may be due to uncertainty about the future or saving plans. Making social comparisons can reduce uncertainty and upward comparisons can provide the motivation to improve. For this reason, the authors gave participants social feedback on their savings decisions. Participants who were randomly told that they underperformed in comparison with their peers were more likely to make changes to their allocation. In Study 1, this group increased their savings more than were those who had been categorized among the better performers or overperformers, or who did not receive social information. Participants were generally more likely to change their behavior when they perceived their performance as being average or below average. The results demonstrate that a social comparison approach has the potential to motivate people to start saving for retirement or increase their current savings.

## KEYWORDS

Behavior change; Decision making; Social norms; Savings behavior

## Introduction

With increasing longevity, future retirees will need to plan and save for a longer older age, but people often struggle to actively engage in planning for their future. Saving for retirement has become a major concern in the United States due to increasing longevity and changes in retirement funding that shift the responsibility to individuals. According to the 2014 Boston College Retirement Risk Index, 52% of Americans do not have enough savings to maintain their lifestyle in retirement (Munnell, Hou, and Webb [2014]). Aside from the impact of any broader economic conditions, many people fail to make plans and act for the future. A lack of willpower to act can be one reason for these struggles. Therefore, automatic enrollment with the possibility to opt out has been a successful strategy in getting people to start saving for retirement (Benartzi and Thaler [2013], Thaler and Benartzi [2004]).

Perceived uncertainty around the future and general uncertainty around which saving plans to choose may also contribute to the observed struggles with retirement savings. To reduce uncertainty and to guide their actions, people often seek social information in the form of expert input, peer advice, or social comparison (Festinger [1954], Gerard [1963], Taylor, Buunk, and Aspinwall [2016]). Besides reducing uncertainty, social norms have been actively used as a

marketing strategy to encourage certain behavior. Research has suggested that behavior can be more effectively changed when changing the context rather than the mind (Dolan, Elliott, Metcalfe, and Vlaev [2012]). Many simple interventions that aim at changing behavior through changing the context have become known generally as nudges (Thaler and Sunstein [2008]). Social norms are powerful nudges because people tend to follow the behavior of others around them. Social norms have been effective in prompting action in areas such as charitable giving (Frey and Meier [2004]), bargaining (Bohnet and Zeckhauser [2004]), voting (Gerber and Rogers [2009]), energy conservation (Allcott [2011], Allcott and Rogers [2012], Frederiks et al. [2015]), and health (Chapman, Colby, Convery, and Coups [2016]). For example, when electricity bills included a report on people's energy use in comparison with their neighbors, energy consumption generally decreased. A meta-analysis that evaluated this approach of a company called OPOWER estimated that energy consumption decreased by 2% in the treatment group (who received the letter that included a social comparison). The treatment was especially effective among high energy users (Allcott [2011]). It was suggested that the social comparison feedback was used as an energy-conversation norm, which made it more

effective than individual feedback (Bruine de Bruin and Krishnamurti [2016]).

When making social comparisons, one values information about other people in relation to the self, which is not necessarily a conscious process. Information on other people may thereby include direct or indirect comparisons based on news stories or word of mouth (Wood [1996]). People often engage in this comparison-making behavior and value their performance, possessions, and wellbeing relative to similar others (e.g., “I did better than X, I have more money than Y”) rather than in absolute terms (Festinger [1954]). Based on these observations, we judge the quality of our lives. We reflect on how nice our house is in comparison with our neighbor’s or how good our kids are doing in school in comparison with their peers. However, people differ individually regarding their tendency to engage in social comparison behavior (Gibbons and Buunk [1999]).

The literature differentiates between descriptive and injunctive norms. A descriptive norm is the perceived prevalence of others’ behavior, while an injunctive norm is the perceived social approval of a behavior within a culture (Cialdini, Kallgren, and Reno [1991]). Most interventions focus on descriptive norms, but injunctive norms can be useful to prevent boomerang effects. Boomerang effects may occur, for example, when people already engage in a desired behavior but change it to conform to the behavior of the majority. For example, a study on the use of social norms to increase energy-saving behavior demonstrated that low-energy consumers actually increased their energy consumption after having been exposed to normative information on their neighbors’ behavior. This boomerang effect could be eliminated, however, by including injunctive norms in the form of a happy smiley-face emoticon to indicate social approval and a sad smiley-face emoticon to indicate social disapproval (Schultz, Nolan, Cialdini, Goldstein, and Griskevicius [2007]).

Social comparison can be upward (i.e., with people who seem to do better) or downward (i.e., with people who seem to do worse). People often feel better about themselves and their lives when making downward comparisons, and feel worse about themselves when making upward comparisons. At the same time, upward comparisons may provide the inspiration to improve and motivate people to reach higher goals (Cialdini and Trost [1998], Feldman [1984], Hackman [1992]). For this reason, upward comparison can be a powerful motivational tool that may help people to improve their savings contribution. Comparisons can

be reinforced when the performance dimension (e.g., savings) is highly relevant for a person and when the target of comparison (e.g., another person) is close and similar in terms of performance or personality (Garcia, Tor, and Schiff [2013]). A particular dimension may thus become salient for an individual simply because it is relevant to a close friend or important in one’s community.

From a psychological perspective, people’s comparisons of themselves with others and their interest in social cues may be keys to encourage financial planning. When making financial decisions, people may benefit from both getting advice from experts and comparing themselves with their peers such as friends or colleagues. A recent study found that expert advice and social comparison were both effective strategies to support people in reaching their savings goals, but that expert advice was more effective. The authors suggested that for financial decision making, peer behavior may not be as valuable as expert knowledge (Gunaratne and Nov [2015]). However, other studies have demonstrated the power of peer comparison in financial planning. Reporting progress toward savings goals to peers has been effective in increasing savings, especially for people who struggle with self-control issues. For instance, social support groups increased saving rates, especially among populations who did not have access to other commitment devices such as a bank account or regular wages (Kast, Meier, and Pomeranz [2012]). In a similar vein, another study showed that including an audience or comparing oneself with others promoted goal attainment (Frederiks, Stenner, and Hobman [2015]). In addition to reaching set goals, social comparison may also be more effective than experts’ advice as a motivation to act at all.

In a field experiment, a social comparison approach was applied to encourage enrollment in savings plans. Employees who did not participate in a savings plan or those who only contributed very little were informed about the fraction of coworkers in their age group that already participated in a certain savings plan. However, it was found that information about the participation rate of their peers did not encourage enrollment, but rather discouraged enrollment in some cases and did not change behavior in the remaining cases. The authors argued that this boomerang effect among low-income participants in particular may have been caused by an increased salience of their relative economic status in the upward social comparison condition (Beshears, Choi, Laibson, Madrian, and Milkman [2015]). However, it may also be that this behavior resulted from reactance (Brehm

[1966], Sunstein [2017]), when prompted to join the X% of peers who have already enrolled. While people like to compare themselves with others, they usually do not like being told what to do and are motivated to regain their freedom when it is threatened.

## Present research

Many financial institutions use a social norms approach to encourage increasing contributions to retirement savings, for example, by incorporating information on other clients' saving rates in their online contribution tools. However, these online tools differ greatly and there seems to be no guideline on how to present social comparison information and prevent boomerang effects in this setting. Research results from Beshears et al.'s [2015] study are not useful here because these online tools do not aim at increasing enrollment in specific saving plans, but rather exclusively focus on the contribution rate. To the best of our knowledge, there is no study that has tested a simple social comparison intervention to increase saving rates. As financial issues and individual contribution rates to retirement savings are a sensitive topic, we conducted our studies with hypothetical scenarios. Thus, we were able to test descriptive and injunctive norms in an experimental setting.

In this article, we present 2 studies investigating the impact of peer comparisons on savings decisions. When designing social comparison mechanisms, the reference group and the particular information provided about that group are key aspects (Roels and Su [2014]). Participants were shown a graph that presumably included the behavior of other participants of the same age (in reality, however, most participants were randomly assigned to a condition) and informed which group of savers they were part of (poor, fair, great, or super savers). The graph indicated the sizes of each of these groups and an arrow showed participants their position along the graph (with the worst performers on the one end and the best performers on the other end). We hypothesized that participants who were told they did less well relative to others (the poor and fair savers) would be especially motivated to improve and increase their saving rates due to upward comparison effects.

To prevent a potential downshift (i.e., boomerang effect) among the best performers in our study (especially the "super savers"), we followed the study design of Schultz et al. [2007] by including injunctive norms in addition to descriptive norms. Therefore, we

provided participants with an injunctive norm in the form of sad smiley-face emoticons to point out below-average behavior and happy smiley-face emoticons to reinforce extraordinary behavior. Previous work has found that adding positive affective cues, such as smiley-face emoticons or rewards, not only potentially prevents the boomerang effect of social norms, but also provides meaning to people and assists them with unfamiliar decisions (Peters, Lipkus, and Diefenbach [2006]). Thus, we expected super savers and great savers to be less likely to change their behavior than those who were told that they performed worse.

## Study 1

In Study 1, we asked participants to imagine they had a certain set amount of money and had to allocate it across a variety of options (adapted from Hershfield et al. [2011], Study 1; see also Appendix A). After participants allocated their money, they were shown a graphic that indicated how well they did saving some of the money in comparison with their peers (people their age). The comparison information was not based on real data. We measured participants' changes in the savings rates after having seen the social comparison graphic.

## Method

The Committee on the Use of Humans as Experimental Subjects at the Massachusetts Institute of Technology reviewed and approved this study. Informed consent was obtained from all participants. We recruited a national sample of 1,246 people through Qualtrics, an online marketing company. To ensure good data quality, we excluded 91 participants from the analysis due to nonsensical answers (e.g., failed attention check) or because they required more than 1 hr or less than 3 min to finish the study (median = 9.63 min,  $M = 13.93$  min,  $SD = 40.77$  min). The remaining 1,155 participants, 18–65 years old ( $M = 45.15$  years,  $SD = 12.39$  years; 65% women), were asked to imagine that they had just received \$30,000 and to think about how they would spend that money. They could allocate their money across 12 expense categories (save, leave in a checking account, pay debts, donate, make a down payment, travel, renovate, buy a new vehicle, buy furniture, buy electronics, buy jewelry or clothing, other). After allocating the money, participants in the intervention group were presented with a horizontal graphic that displayed their savings behavior compared with other



**Figure 1.** Intervention graphic.

Note: Intervention graphic used for the great savers group in Study 1. Participants were given the following information preceding the graphic: “You can now compare yourself with other people your age who participated in this study.”

people their age (see Figure 1). This information was not based on real data, and participants were assigned to 1 of 4 saving groups based on the amount they decided to save.

An arrow indicated into which of 4 groups (poor savers, fair savers, great savers, or super savers) people were categorized. Participants who chose to save \$3,000 or more but less than \$25,000 were randomly assigned either to the fair savers ( $n = 251$ ) or the great savers group ( $n = 270$ ). Those who saved less than \$3,000 (less than 10% of the money) were assigned to the poor savers group ( $n = 300$ ), and those who saved \$25,000 or more (more than 80% of the money) were assigned to the super savers group ( $n = 116$ ). We designed the cutoffs for each saver category to make the categories seem fair and realistic for participants. We reinforced social comparison information by including smiley-face emoticons that also served as affective cues. Poor savers saw a sad emoticon, fair savers did not see any emoticon, good savers saw 1 smiling emoticon, and super savers saw 2 smiling emoticons. However, the smiley faces of all other groups were visible for all, but faded (see Figure 1). Before and after the intervention, participants were asked if they were satisfied with their allocation choices. After the intervention, they were also asked if they wanted to make any changes. A control group, whose data were collected at a later time point ( $n = 218$ ), did not see the graphic, but was told to wait until their answers had been recorded (wait time was 7 s). As a manipulation check, we asked participants how many smiley faces they received (0, 1, 2, do not remember), how they did in comparison with other people their age (worse, about the same, better, do not remember), and which category they were in (poor savers, fair savers, great savers, super savers, do not remember). Participants’ individual preferences for social comparison were measured at the end of

the study with the Iowa-Netherlands Preference for Social Comparison Measure (INCOM; Gibbons and Buunk [1999]), which ranges from 1 (*low preference for social comparison*) to 5 (*high preference for social comparison*), and the sample Cronbach’s  $\alpha = .88$ .

Eight percent of the sample reported having a post-graduate degree, 32% had a college degree, 25% had attended some college, and 21% had a high school diploma or less. In terms of employment status, 39% indicated they were employed full-time, 13% were employed part-time, 18% were not employed, 10% were self-employed, 12% were retired, 3% were students, and 8% had other forms of employment. Half of the participants (50%) indicated they had an annual household income below \$50,000, and 74% had an annual household income below \$75,000.<sup>1</sup>

## Results

### Manipulation check

Following the manipulation and after participants could make changes to their allocations, we checked whether participants in the experimental groups were able to recall correctly the category they had been placed into. Most participants were able to report their category correctly, but 131 participants (14%) failed the manipulation check; within those who failed the check, most were categorized as poor savers (47%), with the proportion of fair (23%) or great (22%) savers about equal to each other. In addition, we asked participants how they thought they did in comparison with their peers. Two thirds of the participants (66%) in the poor savers category thought they did worse than their peers. A large number of the participants in the fair savers category thought they did about the same as their peers (43%), but 38% thought they did worse. Most of the participants in the great savers category (71%) and in the super savers category



(80%) thought they did better than their peers. The results also showed that participants in each group were unsure about how many happy smileys they received; fair and great savers were more likely to report that they received more smileys than they really did.

### Allocation task

When it came to deciding how to allocate their financial windfall, participants chose most frequently to “save” (71%) and “pay debts” (65%). In line with this, the greatest amounts were put in the save ( $M = \$10,660.56$ ,  $SD = \$9,667.71$ ) and pay debts ( $M = \$7,196.71$ ,  $SD = \$8,473.94$ ) categories. The amount people allocated to savings correlated only weakly positively with their annual household income ( $r = .11$ ,  $p < .001$ ). Household income correlated weakly negatively with the amount they put into their checking accounts ( $r = -.07$ ,  $p = .02$ ), and did not correlate with the amount of debts they intended to pay ( $r = -.04$ ,  $p = .21$ ). Income also correlated with the amounts allocated to travel ( $r = .15$ ,  $p < .001$ ), renovations ( $r = .06$ ,  $p = .05$ ), and a new vehicle ( $r = -.11$ ,  $p < .001$ ).

### Decision to make changes

After the intervention, 22% of participants in the experimental groups wanted to make changes to their allocation compared with 13% in the control group,  $\chi^2(1, N = 1155) = 9.52$ ,  $p = .002$ . This difference was even more prominent regarding the changes to savings: 19% ( $n = 177$ ) in the experimental group made changes to their savings as opposed to 8% ( $n = 17$ ) in the control group,  $\chi^2(1, N = 1155) = 15.57$ ,  $p < .001$ . Thus, overall, participants in the experimental group were more than twice as likely to make changes to their savings than were participants in the control group. Figure 2 shows the percentage of participants who decided to make changes to their savings in each category. In general, participants who felt that they did worse in comparison with other people their age (50.8%) were more likely to make changes than were those who felt about the same (26%), better (14.1%), or did not remember (9%),  $\chi^2(1, N = 937) = 52.79$ ,  $p < .001$ .

We did not further analyze the super savers group because only 6 participants in this group decided to make changes. Participants in the remaining experimental groups were compared with corresponding individuals in the control group whose savings allocations matched theirs (i.e., those who initially saved less than \$3,000 corresponded to the poor savers, those who saved \$3,000 or more but less than \$25,000 corresponded to the fair and great savers). Of those participants categorized as poor savers, 32% ( $n = 97$ )

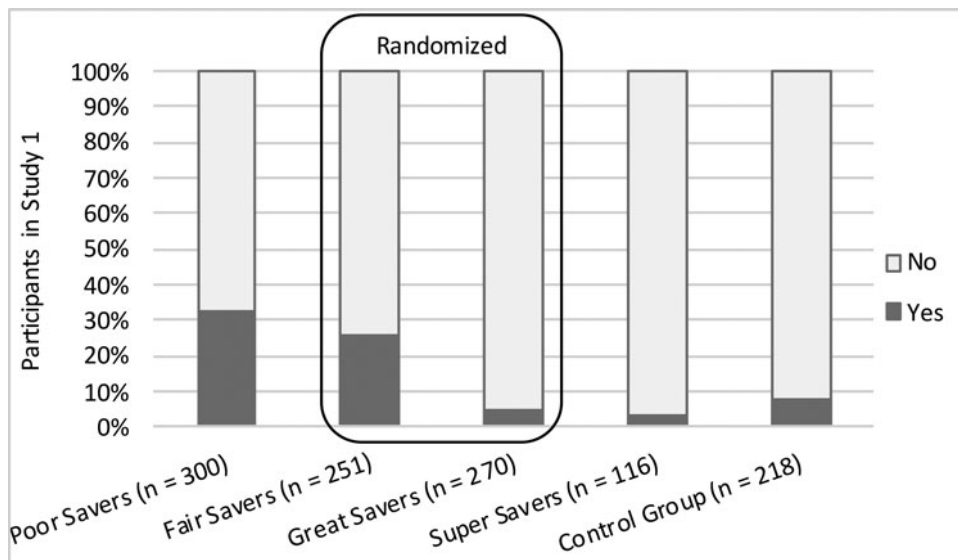
in the experimental group decided to make changes to their savings compared with 9% ( $n = 6$ ) in the corresponding control group who would have been categorized as poor savers. Thus, the odds of poor savers making changes were 4.86 times higher if participants were in the experimental group than if they were in the control group,  $\chi^2(1, N = 367) = 14.83$ ,  $p < .001$ .

In the randomized categories, 26% ( $n = 64$ ) of fair savers, 4% ( $n = 12$ ) of great savers, and 5% ( $n = 6$ ) in the corresponding control group wanted to make changes to their allocation,  $\chi^2(2, N = 642) = 59.92$ ,  $p < .001$ . Comparisons among groups revealed that participants in the fair savers group were 7.36 times more likely to make changes than those in the great savers group,  $\chi^2(1, N = 521) = 46.28$ ,  $p < .001$ , and 6.56 times more likely to make changes than those in the control group,  $\chi^2(1, N = 372) = 22.55$ ,  $p < .001$ . There was no difference between great savers and the control group,  $\chi^2(1, N = 391) = 0.05$ ,  $p = .82$ .

### Amounts saved

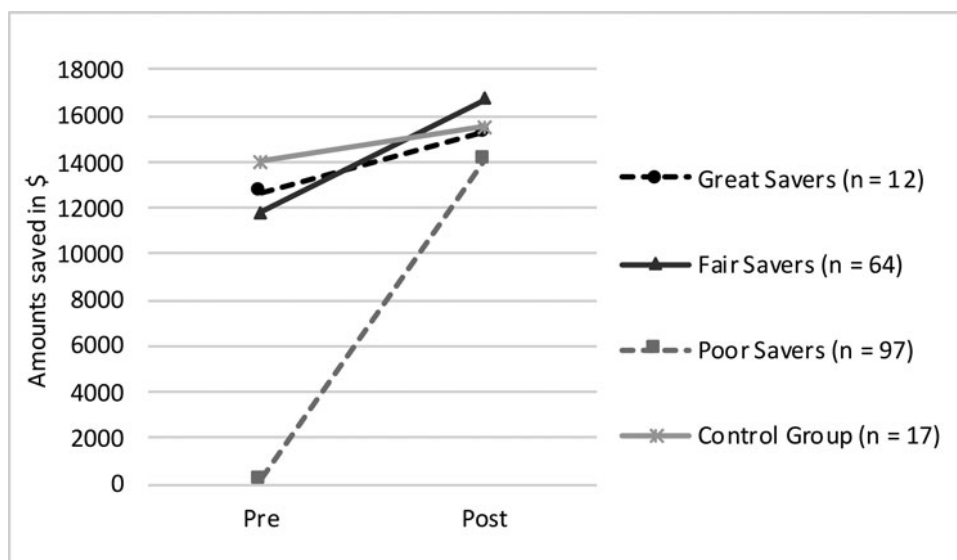
Among those who decided to make changes, amounts saved increased significantly in the poor savers group,  $t(96) = -16.27$ ,  $p < .001$ ,  $d = -2.02$ , and fair savers group,  $t(63) = -7.67$ ,  $p < .001$ ,  $d = -0.97$ , but there was no significant change in the great savers group,  $t(11) = -.913$ ,  $p = .38$ ,  $d = -0.28$ , or the control group,  $t(16) = -.72$ ,  $p = .48$ ,  $d = -0.21$  (see Figure 3). To further investigate changes in amounts saved, we calculated the difference in amounts before and after the intervention (delta). A univariate analysis of variance with category as independent variable (super savers excluded) confirmed the highest deltas among poor savers ( $M = \$13,906.29$ ,  $SD = \$8,418.70$ ) and the lowest in the control group ( $M = \$1,500.00$ ,  $SD = \$8,591.42$ ),  $F(3, 186) = 28.04$ ,  $p < .001$ ,  $\eta^2 = .311$ . Post hoc tests (Hochberg) further acknowledged that poor savers' changes were larger than those of all other groups ( $p < .001$ ), while fair savers, great savers and the control group did not differ significantly from each other in their absolute changes ( $p > .46$ ). In the control group, however, only 17 participants decided to change their amounts saved. Because only 6 of those corresponded to the poor savers group and 6 corresponded to the randomized group (the remaining 5 corresponded to the super savers group), the control group was not included in further analyses.

To investigate predictors for changes in the amounts saved, we conducted a linear regression with INCOM score, household income, gender and age as predictors in the poor savers group ( $R^2 = .11$ ,  $n = 96$ ,  $F = 2.90$ ,  $p = .026$ ). Higher preference for social



**Figure 2.** Changes in savings behavior in Study 1.

Note: Percentage of of participants in Study 1 who decided to make changes to their savings in each category.



**Figure 3.** Changes in amounts saved in Study 1.

Note: Amounts saved before and after the intervention in Study 1 (among those who decided to make changes to their savings), nondotted lines indicate statistical significance ( $p < .05$ ).

comparison (INCOM) ( $B = 3140.58$ ,  $SE = 1243.38$ ,  $\beta = .263$ ,  $p = .013$ ) and lower income ( $B = -1377.05$ ,  $SE = 601.12$ ,  $\beta = -.237$ ,  $p = .024$ ) predicted higher increases in amounts saved, but age and gender did not contribute significantly. However, none of these variables were significant predictors for the changes in amounts saved in the randomized categories ( $R^2 = .05$ ,  $F = 1.02$ ,  $p = .40$ ).

### Discussion

Even though participants were free to choose what to do with their hypothetical windfall, the majority chose

to save it or pay debts. After the intervention, participants in the experimental groups were more likely to make changes to their savings than participants in the control group. We found this for poor and fair savers, but great savers did not differ from the control group. Almost none of the super savers decided to make changes, so this group was excluded from further analyses. Poor and fair savers also increased the actual amounts saved after the intervention and the increase in savings was the highest among poor savers. Again, great savers behaved similarly to the control group, whose amounts did not increase significantly after the intervention. This suggests that

only negative or neutral feedback may influence people's saving behavior.

Participants in the control group were rather unlikely to make changes, but those who did were almost equally distributed across the categories based on their savings decisions—one third in what we would call the poor savers, one third in fair or great, and one third in super. This suggests that the disproportionate changes we saw among poor savers to increase their amounts was a result of the feedback they received. The subjective feeling of doing worse than average also increased the likelihood to make changes.

Saving rates increased more among poor savers with higher preferences for social comparison and lower household incomes. This finding supports the effectiveness of the social comparison approach among those who need it most: those with lower income who tend to save very little. However, the finding also indicates that those with a need for social comparison may benefit the most. Saving rates of all other groups were not predicted by individual preferences for social comparison, income, age, or gender.

## Study 2

Study 2 was based on Study 1 to further investigate the effectiveness of a peer comparisons approach to encourage savings behavior. Instead of offering a large one-time amount, we asked participants in Study 2 to imagine they had a certain amount available each month and were specifically asked how much they would save each month. Social comparison information was displayed in a horizontal graphic with affective cues as in Study 1 in one condition and as a vertical graphic without affective cues in the other condition. Social comparison processes are linked to competitive behaviors because people are driven by upward comparisons and motivated to decrease discrepancies with high-performing peers (Festinger [1954]). Garcia et al. [2013] argue that social comparisons increase due to not only individual factors, such as the relevance of performance dimension, but also situational factors, such as rankings (i.e., proximity to a standard). We hypothesized that the vertical graph would intensify the competitive aspect of the task and affective cues may not be necessary due to stronger motivation to reach the “top.”

## Method

This study was reviewed and approved by the Committee on the Use of Humans as Experimental Subjects at the Massachusetts Institute of Technology.

We obtained informed consent forms from all participants. In this study, 696 people participated, of whom we excluded 66 because of nonsensical answers (e.g., failed attention check) or it took them more than 1 hr or less than 2 min (one third of the median) to finish the study (median = 7.91 min,  $M = 22.12$  min,  $SD = 132.23$  min). The remaining 630 participants (72% women), 18–40 years old ( $M = 28.00$  years,  $SD = 5.30$  years), were asked to imagine being single, living alone, and just having started a new job. After taking out taxes and Social Security, and covering regular basic expenses such as housing, food, and utilities, they would be left with \$500, which they may need to cover additional expenses, including transportation, clothing, travel, entertainment, and others. Participants were then asked how much they would put aside each month for savings and how much they would additionally borrow (e.g., by using credit cards) each month (based on Griskevicius et al. [2012] Study 3; see also Appendix A). The question on borrowing was included to give participants more options, but was not analyzed. After their choice, participants in the experimental conditions received feedback on their savings behavior in comparison with their peers. Those who had saved more than \$25 but less than \$400 was randomly assigned to either the fair savers ( $n = 182$ ) or the great savers ( $n = 200$ ) group. Those who had saved \$25 or less were assigned to the poor savers group ( $n = 41$ ), while those who saved \$400 or more were assigned to the super savers group ( $n = 10$ ). The control group did not see the graphic but was asked to wait until their responses were recorded ( $n = 197$ ; wait time was 7 s).

As opposed to Study 1, there were 2 conditions concerning the display of the social comparison information: Participants saw their category with an affective cue added (happy or sad smiley-face emoticon) in a horizontal display (as in Study 1;  $n = 222$ ) or without affective cues in a vertical display ( $n = 211$ ). This change was made to investigate the potential advantage of a vertical display without injunctive norms (see Figure 4). For the manipulation check, we included the same variables as in Study 1.

Education of this sample was mostly postgraduate (35%) or college degree (36%). The sample further consisted of mostly full-time employed (58%) or student (33%) participants. About two thirds (58%) of participants had savings for retirement outside of Social Security or a pension, but 14% did not know yet where to draw income from in retirement. Many (43%) did not indicate how much they had in retirement savings, but of those who did, 35% indicated that they





**Figure 4.** Vertical intervention graphic.

Note: Vertical intervention graphic used for the super savers group in Study 2. Participants were given the following information preceding the graphic: "You can now compare yourself with other people your age who participated in this study."

had currently saved less than \$25,000. More than half of the participants (59%) indicated they had an annual household income below \$75,000 (of those, 42% had an annual household income below \$50,000 and 19% had an annual household income below \$25,000).

## Results

### Manipulation check

After the intervention and after participants had made changes to their saving decision, we checked whether they were able to recall their category. Most participants were able to report their category correctly (86%), but in the vertical orientation group, 35% recalled the wrong category or did not remember their category (of those who recalled the wrong category, 79% were categorized as fair savers in the vertical category, of whom 60% indicated they did not remember their category). In addition, we asked participants how they thought they did in comparison with their peers. Most of the participants (72%) in the poor savers category thought they did worse than their peers. In the fair savers category, 39% thought they did about the same as their peers, while 32% thought they did better. Most of the participants in the great savers category (72%) and almost all of the participants in the super savers category (92%) thought they did better than their peers.

### Decision to make changes

Overall, 31% of participants in the experimental groups and 19% in the control group wanted to make

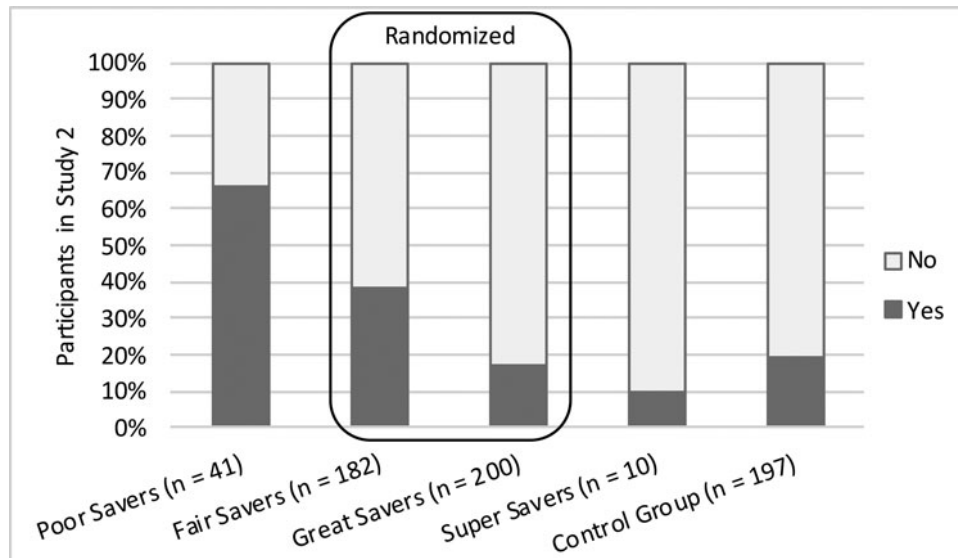
changes to the amount saved,  $\chi^2(1, N = 630) = 8.61, p = .003$ . Figure 5 shows the percentage of participants who decided to make changes in each category. Independent of their categorization, participants who felt they did worse than their peers were more likely to make changes (53%) than were participants who felt about the same (34%), better (24%), or could not remember how they did (12%),  $\chi^2(3, N = 433) = 23.43, p < .001$ .

Participants in the remaining experimental groups were compared with corresponding individuals in the control group whose savings allocations matched theirs (i.e., those who initially saved \$25 or less corresponded to the poor savers, those who saved more than \$25 but less than \$400 corresponded to the fair and great savers). Of those participants categorized as poor savers, the majority (66%) wanted to make changes to their amount saved after having seen the graphic. A much smaller portion of participants (18%) in the corresponding control condition, who would have been categorized as poor savers according to their amounts saved, wanted to make changes,  $\chi^2(1, N = 64) = 13.86, p < .001$ . Based on the odds ratio, the odds of participants to make changes was 9.19 times higher if they were in the poor savers group than if they were in the control group. Orientation (vertical vs. horizontal presentation) did not influence poor savers' decision to make changes,  $\chi^2(1, N = 41) = 0.02, p = .90$ .

In the randomized groups, fewer participants decided to make changes than in the poor savers group (39% of fair savers, 17% of great savers, 20% in the corresponding control group),  $\chi^2(2, N = 554) = 26.99, p < .001$ . Comparison between groups revealed that the odds of making changes were 3.15 times higher for fair savers than for great savers,  $\chi^2(1, N = 382) = 22.15, p < .001$ , and 2.25 times higher in the fair savers group than in the corresponding control group,  $\chi^2(1, N = 354) = 14.90, p < .001$ . There was no difference between great savers and the corresponding control group,  $\chi^2(1, N = 372) = 0.47, p = .49$ . Orientation influenced fair savers' decision to make changes,  $\chi^2(1, N = 182) = 13.94, p < .001$ , but not great savers' decision,  $\chi^2(1, N = 200) = 0.18, p = .669$ . The odds of fair savers making changes were 3.55 times higher in the horizontal group than in the vertical group, indicating an advantage of the horizontal display of the social comparison information for the fair savers.

### Amounts saved

Among those who decided to make changes, amounts saved increased significantly in the poor savers group,



**Figure 5.** Changes in savings behavior in Study 2.

Note: Percentage of of participants in Study 2 who decided to make changes in each category.

$t(26) = -5.80, p < .001, d = -1.28$ ; the fair savers group,  $t(69) = -14.82, p < .001, d = -1.86$ ; the great savers group,  $t(32) = -6.56, p < .001, d = -1.26$ ; and the control group,  $t(33) = -4.97, p < .001, d = -0.88$  (see Figure 6). As expected from the  $t$ -test analyses, a univariate analysis of variance based on the delta (difference between savings before and after the intervention) did not reveal significant differences between categories (super savers were excluded),  $F(3, 159) = 2.38, p = .07, \eta^2 = .04$ . Neither the amount participants decided to save ( $r = -.01, p = .73$ ) nor the amount they decided to borrow ( $r = -.04, p = .33$ ) correlated with their annual household income.

To investigate predictors for changes in the amounts saved, we conducted a linear regression with INCOM score, household income, and age and gender as predictors in the poor savers group, which was not significant ( $R^2 = .28, n = 26, F = 2.18, p = .11$ ). Similarly, none of these variables were significant predictors for the changes in amounts saved in the randomized categories ( $R^2 = .04, F = 0.89, p = .48$ ).

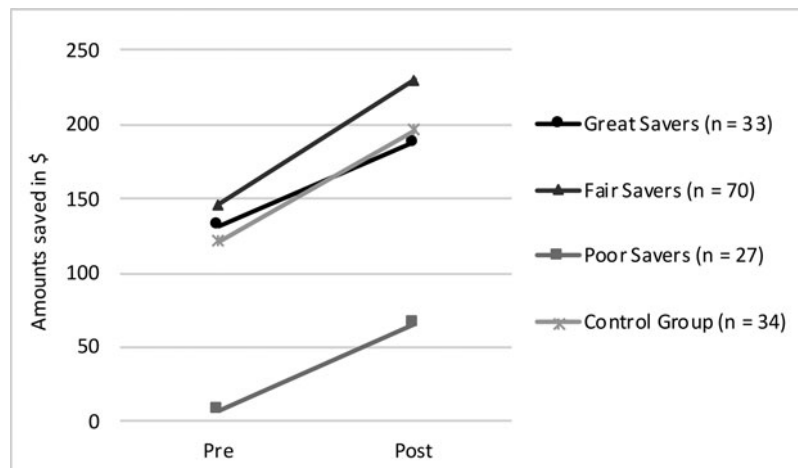
## Discussion

Participants in the experimental groups of Study 2 were more likely to make changes to their amounts saved than were participants in the control group. This was especially true for those who had saved less than \$25 and were categorized as poor savers. In addition, those who had randomly been assigned to the fair savers group more often wanted to make changes than participants in the control or great savers groups. In addition to the objective categorization, the subjective feeling of doing worse than average increased the

likelihood to make changes. Those categorized as super savers did not make changes. These results replicate the findings from Study 1.

In Study 2, we included 2 different version of the manipulation graphic—a horizontal bar versus a vertical bar that indicated participants' performance in comparison with their peers. A horizontal orientation increased the fair savers' likelihood to make changes, but did not influence other results in Study 2. It is possible that the desire for the positive affective cue was more motivating than reaching for the "top." In addition, the vertical condition caused false memories, especially among those categorized as fair savers. This may have been due to that category being at the lower edge of the screen depending on screen size. Thus, a horizontal presentation of categories is suggested to be more useful in future studies. However, a limitation of this manipulation is the confounding of orientation and injunctive norms; therefore, we cannot conclude whether the vertical orientation or the lack of affective cues decreased its effectiveness.

In each category, including the control category, participants in Study 2 were more likely to make changes than were participants in Study 1. Because this was also found for the control category, we assumed that specifically asking about savings as well as the simpler design (making changes involved less work for participants in Study 2 than in Study 1) may explain this finding. In line with this, savings rates increased significantly in all categories among those who decided to make changes. According to the effect sizes, this increase was slightly stronger among the poor, fair, and great savers than the control group. The increase among the great savers and the control



**Figure 6.** Changes in amounts saved in Study 2.

Note: Amounts saved before and after the intervention in Study 2 (among those who decided to make changes to their savings), all pre-post changes are statistically significant ( $p < .05$ ).

group, which was not found in Study 1, may also stem from the experimental design as well as sample characteristics. Participants in Study 2 were given a smaller amount of money on a monthly basis, which might evoke much less uncertainty than a large one-time amount. Most people regularly deal with allocating parts of their monthly income to savings, but usually do not receive a large one-time amount of money. In Study 2, participants were also explicitly asked how much they wanted to save and whether they wanted to make changes to their savings. In Study 1, on the other hand, they were asked if they wanted to make changes to their allocation and were then given many choices of possible allocation options in which “save” was just one. Thus, it was unlikely that anyone who answered yes to this question would decrease the amount. As a result, the focus on saving was clearer in Study 2 and presumably reduced variance between categories. In addition, the studies also differed in terms of the sample. In Study 1, a nationwide sample was used that was characterized by lower education and lower income, as opposed to the sample in Study 2, which was recruited from the lab’s database and mainly included participants from the greater Boston area with higher income and higher education. Thus, due to their economic circumstances, this group may have been more willing to increase their monthly savings in general.

## General discussion

In 2 studies, we offered participants hypothetical amounts of money and measured how much of it they would save. Participants in the experimental groups were presented with social information on

their savings behaviors in comparison with their peers. Although fair savers and great savers saved on average the same amounts, random assignment to different groups clearly influenced their behavior. As hypothesized, poor and fair savers were more likely to make changes than were those who had been categorized as great or super savers or who did not receive information on their peers (the control group). The subjective feeling of doing worse than average as a result of the upward social comparison seemed to increase the likelihood of people making changes, which further supports the effectiveness of the approach. Participants in both groups also increased the amounts they saved after having been informed about their peers’ performance. This is in line with previous research on voting behavior (Gerber and Rogers [2009]), charitable giving (Frey and Meier [2004]), and energy conservation (Allcott and Rogers [2012], Frederiks et al. [2015]), which has demonstrated a positive impact (i.e., higher participation in elections, higher donations to charitable funds, more energy conservation) of messages incorporating a social comparison approach. Study 1 also indicates that the approach may especially be beneficial for low-income participants who tend to save little, but have a strong preference for social comparison.

In Study 1, participants in the great savers and control groups did not change their saved amounts significantly, while in Study 2 savings increased for all who made changes. The design in Study 2 included a smaller monthly amount (as opposed to a larger one-time amount) and specifically asked about savings (as opposed to offering several allocation options), so it may have encouraged those who decided to make changes to their savings to increase them as well—

even the control group results indicate that just the opportunity to have a second thought around amount saved may make a difference. In addition, the situation in Study 2 may have created less uncertainty than the situation in Study 1 because it seems more like a real situation people would encounter in their daily lives; thus, participants may have relied more on their experience than on social comparison information. Nonetheless, our results are promising, because receiving social information clearly encouraged action in a positive way—especially among those who were informed they were below the norm. Poor savers were more likely to make changes to their savings than their corresponding control group, and fair savers were more likely to make changes than the great savers or the control group.

As expected, the best performers (super savers) did not change their behavior, and the smiley-face emoticons may have been effective cues to them to prevent a potential boomerang effect. We cannot conclusively determine this, however, due to our study design; there is a potential confounding between the orientation and affective cues. Simply saving the maximum they could manage may have driven the participants' behavior. It is also possible that no boomerang effects exist in the savings context. This should be investigated in future studies. Similarly, we found more false memory reports in the vertical presentation, which could be due either to graphical orientation or the lack of affective cues. Future researchers should critically evaluate different forms of presenting descriptive and injunctive norms to explore their impacts on people's comparison and behaviors in a savings context.

Although financial institutions are already using social comparison to increase retirement savings, there is a lack of empirical research that supports this approach or indicates the best ways to implement it in a financial setting. Our results demonstrate that a social comparison approach is promising to motivate people to start saving for retirement or to increase their current savings. To demonstrate the power of social comparisons to affect savings, however, field studies need to be conducted to test this approach with real world behavior. In addition to replicating our results in the real world, we need to understand better what works and what does not in terms of presenting information. For example, simplicity and graphical information seem to play an important role when communicating, as was shown in the letters that were sent out in the successfully implemented OPOWER energy conservation study (Allcott and Rogers [2012]). Yet, financial institutions that currently use social comparison

information have very different ways of implementing it, from offering very generalized information simply based on age and income to producing complicated statements that may be challenging to understand intuitively or unappetizing to read at all. Just as a choice architect designs “nudges,” a social planner designs mechanisms of social comparison, but research on the latter is still in its infancy in financial settings (for a general approach, see Roels and Su [2014]). Thus, open questions remain around: whether a boomerang effect exists in the context of savings behaviors, how much information should be included to prevent a potential boomerang effect when relative economic status is made salient (cf. Beshears et al. [2015]), what reference group people care most about (cf. Roels and Su [2014]), and how much personalization is needed. Addressing these questions in a financial setting will enhance our understanding of the power of the approach to encourage savings behaviors as well as the limits of social comparisons to affect behavior change.


## Note

1. The median income in the United States was \$56,516 in 2015 (Proctor, Semega, and Kollar [2016]).

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**Appendix**

**Design Study 1**

Imagine you just received \$30,000



**What are you going to do with \$30,000?**

Please choose 1 or more of the following options.

Save	Make a down payment
Leave in checking account	Buy jewelry / clothing
Pay debts	Buy furniture
Donate	Buy electronics
Travel / go on vacation	Buy a vehicle
Renovate	Other (please specify):

Please indicate how much of the \$30,000 you want to allocate to your chosen options.

**Design Study 2**

Imagine you are single, live by yourself and have just started a new job.

After taking out taxes and social security, and covering your regular basic expenses such as housing, food, and utilities, you are left with \$500 each month.

You may need this to cover additional expenses, including transportation, clothing, travel, entertainment, and other things.

Of your \$500, how much money would you realistically intend to set aside for savings each month (in US\$)?

After spending your paycheck on various expenses, you might have little or no disposable income left. However, you can borrow money (e.g., charge on credit card), whereby you would plan to pay back the money later.

How much money would you be comfortable with borrowing each month to spend on things that you might not be able to afford (in US\$)?