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The social and ethical consequences of a calculative mindset

Long Wang [a], Chen-Bo Zhong [b], J. Keith Murnighan [c,*]

[a] Department of Management, City University of Hong Kong, Hong Kong, China
[b] Rotman School of Business, University of Toronto, Canada
[c] Kellogg School of Management, Northwestern University, 2001 Sheridan Rd, Evanston, IL 60201, USA

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ABSTRACT

Rational choice models suggest that decisions should be both deliberate and calculative. In contrast, the current research suggests that calculations may lead to unintended social and moral consequences. We tested whether engaging in a calculative task would lead decision makers to overlook the social and moral consequences of their subsequent decisions and act selfishly and unethically. In each of the first four experiments, participants first completed either a calculative or a comparable, non-calculative task followed by an ostensibly unrelated decision task (either a Dictator or a modified Ultimatum Game). Compared to the non-calculative tasks, completing the calculative tasks led people to be consistently more selfish in the Dictator Game and more unethical in the modified Ultimatum Game. A final experiment tested whether the calculative task led to more self-interested behavior through increased utilitarian judgments and dampened emotional reactions; it also examined whether a subtle, social intervention might mitigate these effects.

Introduction

Organizational decision makers who hope to make optimal financial decisions must take great care as they engage in extensive, deliberate calculations of costs, profits, and risks. Thus, the role of analysts, who spend much of their time and attention on numerical calculations, seems to have become increasingly prevalent within organizations. Rational choice theory suggests that their calculations are both appropriate and effective, as maximizing profits and expected utilities is essential to organizational decision making and organizational success (Scott, 2000; Simon, 1986). Calculations are also an essential element in all sorts of market exchange interactions that involve prices and profits.

Many market exchanges, e.g., the sales of stocks and bonds, can be completely impersonal because their most important characteristics tend to be money and other quantitative metrics. Interpersonal relationships in organizations, however, are not limited to market exchanges. Fiske's (1992) classic analysis of human relations, for example, suggests that organizational members engage in many kinds of non-quantitative social relationships, from altruistically sharing resources to creating systems that provide transparency, consistency, and fair treatment. While calculative approaches fit market pricing interactions well, they may be less effective in other types of social relationships, particularly when concerns for altruism, fairness, reciprocity, and other social values cannot be readily translated into monetary or numeric metrics (Tetlock, Kristel, Elson, Green, & Lerner, 2000).

In the current research, we suggest that repeated exposure to calculations can predispose people to adopt a calculative mindset, i.e., an unintended cognitive predisposition to analyze (non-quantitative) problems mathematically. In common parlance, this is a "crunch the numbers" approach to problems with people reducing "all the relevant features and components under consideration to a single value or utility metric that allows the comparison of many qualitatively and quantitatively diverse features" (Fiske's, 1992, p. 691). We suggest that the nature of many organizational roles compels people to take a calculative approach to non-quantitative problems, thereby reducing their consideration of the interpersonal, social, and moral aspects of their decisions (Bennis, Medin, & Bartels, 2010; Haidt, 2001; Zhong, 2011). To test this prediction, we conducted five experiments to examine the effects of engaging in a calculative task on people's moral decisions in two different social interactions. We predicted that a calculative mindset would lead people to be more selfish and unethical than if they had engaged in a comparable, non-calculative task. We also tested two potential mechanisms for these effects.

* Corresponding author. Fax: +1 847 491 8896.
E-mail addresses: longwang@cityu.edu.hk (L. Wang), Chenbo.Zhong@Rotman.Utoronto.Ca (C.-B. Zhong), keithm@kellogg.northwestern.edu (J.K. Murnighan).

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The rational limits of calculativeness

Rational choice theory, arguably one of the most important theories in economics (Sugden, 1991) and other social sciences (Scott, 2000), assumes that the use of calculative strategies is essential to decision-making. From Edgeworth's "economical calculus" (1881) to the central notion of utility maximization, classical economics assumes that rational individuals assess and calculate the costs and benefits of their available options in "a cognitively intensive, calculating process of maximization of self-interest" (Smith, 1991, p. 878). Prescriptively, this approach suggests that people should calculate the costs and benefits of their alternatives to maximize their outcomes (Rabin, 1988; Shafir, Simonson, & Tversky, 1993).

Rational calculations hold a central place in organizational decision making: financial decisions depend on the evaluation of options; behavioral decisions often depend on the evaluation of appropriate action (March, 1978); strategic decisions depend on the evaluation of the Net Present Value of potential ventures (Besanko, Dranove, Shanley, & Schaefer, 2009); and ethical decisions depend on evaluations of a choice's potential for harm and good (e.g., Epicurus, Bentham, Stuart; Balot, 2001). Thus, a variety of approaches and disciplines assume, at least implicitly, that optimal choices require deliberate, calculative strategies (Scott, 2000).

Although formal models of rational choice are rigorous and can easily generate testable implications, they encounter conceptual and empirical challenges because people tend to be less calculative than rational models prescribe (Rabin, 1988; Simon, 1986). In essence, a calculative conception of choice does not accurately reflect how people normally make their decisions (Shafir et al., 1993; Weirich, 2008). Reports on a variety of complex decisions (e.g., the Cuban missile crisis; Allison, 1971), for example, suggest that people's decision processes are often non-quantitative. In addition, even when decision makers try to conform to the prescriptions of rational choice, their attempts to calculate expected values tend to exclude non-quantifiable factors and values that may be particularly important (Dierksmeier, 2011). As Keynes (1936; 297–298) noted, "too large a proportion of recent 'mathematical' economics are mere concoctions, as imprecise as the initial assumptions they rest on, which allow the author to lose sight of the complexities and interdependence of the real world in a maze of pretentious and unhelpful symbols." Similarly, von Hayek mentioned in his Nobel prize lecture (1974) that the "failure of the economists to guide policy more successfully is closely connected with their propensity to imitate as closely as possible the procedures of the brilliantly successful physical sciences – an attempt which in our field may lead to outright error." Thus, Simon (1986) suggested that rational utility maximization should only be a small part of economic reasoning and Gigerenzer (1996) suggested that consistency and maximizing are insufficient because they overlook the diverse nature of interpersonal and organizational interactions.

Calculation and morality

How to precisely translate moral values into an analytical calculus creates an even more vexing challenge (Dierksmeier, 2011) because moral values are often orthogonal to monetary values. Immanuel Kant (1785), for example, noted that "Everything has either a price or dignity. Whatever has a price can be replaced by which is equivalent; whatever, on the other hand, is above all price, and therefore admit of no equivalent, has a dignity." Similarly, Blau (1967) noted that "by supplying goods that moral standards define as invaluable for a price in the market, individuals prostitute themselves and destroy the central value of what they have to offer (p. 63)." Thus, a calculative, market-price approach to non-marketable goods can jeopardize their moral values. Titmuss (1970), for example, argued that commercializing blood donations can change the giving of blood from a sacrosanct gift to a profane commodity. More recently, Falk and Szech (2013) have shown that market interactions erode moral values that are attached to harm and damage done to third parties.

Gneezy's (2005) analysis of the economics and the philosophy of lying also suggests a divergence of morality and calculations. He found that people have a natural aversion to lying, even when lying can benefit others (i.e., white lies): when people were given a choice to lie, many of them avoided white lies that could make both themselves and another person economically better off (Erat & Gneezy, 2012). This suggests that people consider more than just numerical, consequential calculations when they decide whether they will lie. Instead, values that are not reflected in economic and numerical metrics seem to drive their choices (e.g., lying is both morally wrong and emotionally repellent).

Indeed, social and moral judgments are often broad and non-calculative. For example, Williamson (1993) suggested that, although economics treats decisions to trust as calculative, personal trust is not calculative because people suppress their calculative tendencies in their personal interactions. Similarly, Haidt's (2001) social intuitionist model suggests that moral judgments generally do not require deliberate calculations because people's immediate moral intuitions, rather than their subsequent rational reasoning, drive their moral judgments. Haidt also suggested that people naturally rely on their moral intuitions, experiencing quick, affective, moral reactions that are both evolutionarily rooted and socially adaptive. For instance, he and his colleagues have observed that people tend to make harsher moral judgments when they experience disgust, even when disgust was incidentally induced (Schnall, Haidt, Clore, & Jordan, 2008; Wheatley & Haidt, 2005).

Given the potential incompatibility between morality and calculation, some researchers have noted that the use of market pricing approaches to model broad social and moral relationships is socially ignorant or even morally contemptible (Falk & Szech, 2013; Tetlock et al., 2000). When people face moral dilemmas, a calculative approach may not be able to adequately incorporate a problem's most critical – non-calculable – contingencies. Bennis et al. (2010), for example, suggest that calculating reduces the impact of intrinsic and moral values, especially values that are not easily quantified (Tetlock et al., 2000) or are related to a person's emotions (Haidt, 2001). Although people tend to use monetary and utility calculations when they make organizational and social decisions (March, 1978), many of their decisions may depend on social and moral values that cannot be easily or precisely calculated or quantified (Kelman, 1981; Marcuse, 1964). Thus, cost and benefit calculations do not always lead to optimal results (Bennis et al., 2010). In particular, when morals and economics conflict, e.g., when achieving social welfare is costly, overemphasizing economic values can subdue moral considerations. Indeed, economic assumptions of utility maximization often lead economics students to be self-interested (Frank, Gilovich, & Regan, 1993) and even positively inclined toward greed (Wang, Malhotra, & Murnighan, 2011).

Research on the negative consequences of deliberative thinking also suggests an inverse relationship between calculation and morality. Small, Loewenstein, and Slovic (2007), for example, found that priming people to think deliberatively through a simple calculation task (vs. an affect-laden task) reduced donations towards identifiable but not towards statistical victims, suggesting that deliberative thinking dampened the effects of sympathy towards individual victims. Similarly, Zhong (2011) found that deliberative decision making increased unethical behavior and reduced altruism because it crowded out moral intuitions that are necessary for moral judgments and decisions. In addition, using Small

et al.'s (2007) calculation task, Zhong found that, compared to an intuitive approach to decision making, engaging in calculative, analytic deliberation induced higher rates of deception.

Although Small et al. (2007) and Zhong (2011) used a calculative task in their studies, their evidence on the relationship between calculativeness and morality was suggestive rather than conclusive. For instance, because they both compared a calculative task to an affective task, any difference between them could have been driven by the affective task rather than by the calculations. In addition, their calculation tasks included a mixture of both monetary and non-monetary calculations; priming money may have independent (negative) effects on people's moral decisions because money is the most common metric for market pricing and attempts to monetize non-market or sacred values can block important social and moral concerns (Blau, 1964; Kelman, 1981; Tetlock et al., 2000). Thus, it is important to determine whether calculative thinking on its own, with and without monetary calculations, also influences moral decision making. To address these issues, we investigated whether simple monetary and non-monetary calculations, compared to other kinds of non-calculative but similarly deliberative thinking, amplified the salience of self-interest (Jevons, 1871/1970), crowded out social and moral concerns (e.g., Deci & Ryan, 1985; Frey & Jegen, 2001), and increased both selfish behavior and lying.

Utilitarianism and emotions

Although previous research suggests that calculations can undermine moral decision making by diminishing the influence of moral emotions (e.g., Small et al., 2007; Zhong, 2011), what is driving this effect has not been clearly identified. Thus, in the current work, we also test two possible underlying mechanisms. First, we expect that a calculative mindset will increase people's utilitarian concerns, thereby trumping other moral concerns. Although utilitarianism is an important moral perspective, it treats humans as means rather than ends; it also conflicts with deontology's focus on duty and rights (Kant, 1785). A calculative approach is completely consistent with utilitarianism by seeking the greatest good for the greatest number of people, and utilitarian decisions require calculations to convert the relevant decision factors into a single measurable utility metric. Although this approach seems both rational and straightforward, we expect that it will be prone to inappropriate quantitative conversions of decision factors that are, in essence, non-quantifiable. Thus, utilitarian judgments may be behind the negative social and moral effects of calculations.

In contrast, because emotions, especially moral emotions, can increase the cost of immoral actions such as selfishness and lying, they are often the driving force behind moral action (Tangney, Stuewig, & Mashek, 2007). In particular, when people feel badly enough, either because lying is morally unacceptable or because it harms other people, they lie less often. A rational, calculative mindset, however, can lead people to make more impersonal evaluations, independent of emotions, biasing their moral judgments and increasing the likelihood of lying, especially when they do not perceive the severity of deception's potential consequences. Thus, if a calculative mindset leads people to detach their feelings from their decisions, e.g., to feel less badly about being selfish or deceptive, they may be more easily tempted by self-interest or more easily justify their self-interest. As a result, they can become more selfish or more deceptive as they overlook the associated emotional costs. This is consistent with the findings on deliberative thinking's diminishing emotional influence (e.g., Small et al., 2007; Zhong, 2011) in decision making as well as early research showing that employees who adopt calculative rather than affective commitments to their organizations display less positive work attitudes (Allen & Meyer, 1990), reduced job involvement and job satisfaction, and increased turnover (Mathieu & Zajac, 1990). Thus, in addition to a utilitarian outlook, we also test whether detached affect acts as a driving force behind the negative social effects of a calculative mindset.

Pretests of two calculative tasks

The logic behind the current research depends on the idea that engaging in calculative tasks will activate a calculative mindset that influences people's subsequent decisions. Research has shown that priming, i.e., exposure to stimuli that increases individuals' sensitivity to related stimuli, has strong effects on a wide array of subsequent thoughts and behavior, from word recognition (e.g., Ostergaard, 1998) to displays of cultural values (e.g., Oyserman & Lee, 2008). Priming effects do not even need to be consciously recognized to have these kinds of effects (e.g., Huang & Murnighan, 2010). Neurological research also shows that priming activates specific areas of the brain, facilitating related neural processing (Ghuman, Bar, Dobbins, & Schnyer, 2008). Thus, prior to testing our main hypotheses, we conducted two pretests to assess the effects of priming a calculative mindset on people's thinking processes.

We chose two sets of calculative tasks, one monetary and the other not; we also used two sets of non-calculative tasks as comparable control conditions. Thus, each pretest compared the effects of engaging in calculative vs. non-calculative tasks (monetary and non-monetary) on individuals' perceptions and feelings.

The first pretest compared the impact of a microeconomics tutorial on Net Present Value (NPV), a common technique used to calculate the current and potential future effects of an investment, vs. the impact of an economic history tutorial on the Industrial Revolution (IR). The second, non-monetary pretest compared the impact of responding to a series of math or verbal problems from the Graduate Record Examination (GRE). Both pretests' dependent variables were a set of items that we designed to tap how people were thinking, especially whether they were thinking more of themselves or others.

In the NPV-IR pretest, 24 participants read an economics class handout that explained the principles, formulas, and methods of calculating NPV and 22 participants read an excerpt, comparable in length to the NPV materials, from an internet description of the history of the Industrial Revolution. Both tutorials ended with a quiz asking them to calculate several NPVs or report on the IR tutorial's text material. For the GRE pretest, 15 participants answered 23 GRE math problems and 29 participants answered 23 GRE verbal problems. The GRE math and verbal problems were randomly selected and pretested to ensure that they were comparably difficult.

After completing one of these four tasks, participants reported on 1-to-7 scales how much the task made them think: socially, self-interestedly, mathematically, numerically, and considering others. The math and numerical questions were combined to form a 'think mathematically' index ($\alpha = .96$; and $\alpha = .94$ in the two pretests, respectively). They also rated how they felt about their performance and how difficult the task was.

The participants' difficulty and liking ratings of the calculative and non-calculative tasks did not differ (p's > .10; ns). As expected, they reported that the NPV ($M = 5.33$; $SD = 1.34$) and GRE math tasks ($M = 6.00$; $SD = 1.30$) led them to think more mathematically than the IR ($M = 1.36$; $SD = .79$) and GRE verbal tasks did ($M = 1.80$, $SD = .96$; $t(44) = 12.10$, $p < .001$; Cohen's $D = 3.61$; $t(44) = 12.58$, $p < .001$; Cohen's $D = 3.67$), suggesting the presence of calculative mindsets. Tables 1 and 2 report other results, which suggest some initial effects of activating a calculative mindset. For example, participants indicated that the NPV tutorial made them think less socially and more about themselves than the IR tutorial did (see

Table 1
The means (standard deviations) of participants' post-experiment perceptions and *t*-test comparisons after either the Net Present Value or the Industrial Revolution tutorials in the first pretest.

Tasks	Think analytically	Think socially	Think about the self	Think about others
Net Present Value	5.21 (1.28)	2.38 (1.21)	3.13 (1.68)	2.04 (s1.12)
Industrial Revolution	4.00 (1.74)	3.36 (1.59)	1.82 (1.33)	2.63 (1.53)
t-Tests	$t(44) = 2.69$, $p = .01$	$t(44) = 2.39$, $p < .05$	$t(44) = 2.91$, $p < .01$	$t(44) = 1.51$, $p = .14$

Table 2
The means (standard deviations) of participants' post-experiment perceptions and *t*-test comparisons after either the GRE math or verbal problems in the second pretest.

Task sets	Think analytically	Think socially	Think about the self	Think about others
GRE math problems	5.16 (1.46)	1.86 (.96)	3.28 (1.40)	1.67 (1.06)
GRE verbal problems	5.14 (1.11)	3.16 (1.25)	3.43 (1.66)	3.16 (1.31)
t-Tests	$t(44) = .04$, $p = .97$	$t(44) = 3.90$, $p < .01$	$t(44) = .33$, $p = .74$	$t(44) = 4.18$, $p < .01$

Table 1) and that the GRE math problems led them to think less socially and less about other people than the GRE verbal problems did (see Table 2).

Five experiments[1]

Our main experiments primarily tested the effects of a calculative mindset on self-interested and ethical behavior. Experiments 1 and 2 assessed the effects of reading the same NPV tutorial/quiz compared to reading the same Industrial Revolution tutorial/quiz on people's decisions in two games drawn from the literature in experimental economics. Each game offered one of the two players a simple choice – whether to promote their own self-interest at the expense of a stranger. i.e., by keeping more money in the Dictator game and by lying in the Ultimatum Game. Experiments 3 and 4 tested the same effects with the same set of non-monetary GRE math and verbal problems. After documenting the unintended consequences of both economic and non-economic calculations, Experiment 5 assessed whether a subtle social prime (i.e., choosing one of four family pictures) reduced these effects. It also tested whether a utilitarian approach to decision making or the strength of a decision maker's emotions might explain these effects.

The participants in Experiments 1–4 were told that they would engage in two separate tasks. First, they were randomly assigned to either a calculative or a comparable non-calculative task; then they played a Dictator, or a modified Ultimatum Game. Each game offered one of the two players a simple choice – whether to keep more money in the Dictator game or whether to lie in the modified Ultimatum Game.

In each experiment, we recruited undergraduates from a business school subject pool at a major U.S. Midwest University. We were primarily interested in the choices of the Player 1s, i.e., dictators in the Dictator game and offerers in the modified Ultimatum game. Experiments 1 and 5 did not include Player 2s; experiments 2, 3, and 4 did, but we only report the data from Player 1s' decisions (half of these samples) in these three experiments. (The data from the Player 2s in these experiments is available upon request.)

Experiment 1

The second task in Experiment 1 was the Dictator Game, in which one person (Player 1, the dictator) received a monetary endowment and had complete control in distributing it between themselves and Player 2: they could keep the entire endowment or share any part of it with their counterpart. Research has often used Dictator Games to assess generosity and social motivations (Dana, Cain, & Dawes, 2006; Hoffman, McCabe, & Smith, 1996). We used the dictators' offers to test whether dictators who had engaged in calculative tasks would keep more money than dictators who had engaged in non-calculative tasks.

Research on the Dictator Game has shown that contextual changes can lead to substantial changes in behavior. Hoffman et al. (1994), for instance, found that protecting participants' anonymity decreased the percentage of dictators who gave at least $3 of $10 from 46% (22 out of 48) to 16% (12 of 77). Cherry, Frykblom, and Shogren (2002) asked anonymous dictators to allocate money that they had earned in a previous task and found that 96% of the dictators kept their entire endowment. In contrast, by showing participants a picture of a pair of eyes on their computer screens when they made their decisions, Haley and Fessler (2005) observed nonzero dictators offers ranging from 55% to 88%. More recently, Krupka and Weber (2008) found that both social norms and monetary payoffs predicted behavioral changes across different variations of the Dictator Game. All of these data suggest that the Dictator Game is a sensitive social task and particularly appropriate for testing social and moral behavior (Bardsley, 2008; List, 2007).

Procedures

Experiment 1 included 36 dictators. They were each paid an $8 participation fee plus the money that resulted from their dictator decision. They were randomly assigned to read either the same NPV or IR tutorial that we pretested. Each participant sat in a private room. After the NPV text material, we asked them to calculate several sets of NPVs on their own, after which they received the correct answers. After the IR text material, we asked them a series of quiz questions on what they had just read, followed by the correct answers.

Task #2 asked participants to divide $10 between themselves and another participant in the experiment, with whom they were randomly paired but whom they would never see. They were told that they could offer any amount, from nothing to the entire $10, and that their decision would completely determine their own and their counterpart's additional outcomes. The instructions also clearly noted that their counterpart would know the value of their endowment.

Results

As predicted, NPV dictators kept significantly more money than the Industrial Revolution dictators did: $M = \$9.16$, $SD = 1.74$ vs. $M = \$6.88$, $SD = 2.12$; $t(1,34) = 3.53$, $p = .001$; Cohen's $D = 1.18$, (see Fig. 1 and the Appendix). They kept the entire $10 over three times as often (79% vs. 24%, Fisher's exact test, $p = .002$) and they were over four times less likely to split the money equally (11% vs. 47%; Fisher's exact test, $p = .03$).

[1] In addition to Dictator and modified Ultimatum Games, we also conducted another experiment testing whether the NPV task increased deception in a Deception Game (Gneezy, 2005). The results are consistent with those of Experiment 2. Due to limited space, we do not include this study here, but it is available in the online Supplemental materials.

The participants in the NPV and IR conditions gave 8.4% and 31.2% of their endowment to their counterparts, respectively. The average offers in other experiments using Dictator Games have typically ranged from 15% to 30% (Camerer, 2003). This suggests that the dictators in the IR condition kept a relatively small percentage of their endowment and that the dictators in the NPV condition kept a relatively large percentage of their endowment.

To determine which of the two conditions was more responsible for this effect, we ran an additional Dictator game condition with the same payoffs but no first task, using a random sample from the same subject pool. The 34 dicators in this control condition kept an average of \$6.44 (SD = 2.06), which was significantly different from the amount kept in the NPV condition (Mann–Whitney test, Z = 4.06, p < .001) but not significantly different from the amount kept in the IR condition. The control condition dictators were also significantly less likely to keep all \$10 (21%; Fisher's exact test, p < .001) and more likely to share equally (41%; Fisher's exact test, p = .001) than the NPV dictators. This suggests that the significant effects resulted from the NPV dictators keeping more, as the IR and the control condition dictators' actions did not differ significantly.

Experiment 2

Experiment 1 focused on self-interested behavior; Experiment 2 used a modified version of the Ultimatum Game (Straub & Murnighan, 1995) to assess unethical behavior. The procedures closely followed Experiment 1's except that, following either the NPV or the IR task, participants played the modified Ultimatum Game rather than the Dictator Game. In this game, Player 1s decided how to allocate \$10 and Player 2s decided whether to accept their proposal. If Player 2s accepted, both players received the amounts specified in the proposal. If Player 2s rejected it, neither of them received any additional payment. Unlike the original Ultimatum Game (Güth, Schmittberger, & Schwarze, 1982), only Player 1s knew the value of their endowment and, when they made their proposals, they also reported its value. Thus, they could lie about their endowment's value in hopes of increasing the likelihood that Player 2s would accept a smaller offer that they might otherwise reject.

In this experiment, 68 participants were Player 1s; the procedures replicated most of Experiment 1's. After the NPV or Industrial Revolution task, participants played the modified Ultimatum Game. Player 1s made a proposal that divided \$10 between themselves and Player 2s. They used a simple paper form to write down both the size of their endowment and their offer to Player 2. The experimenter presented this form to Player 2s, who indicated whether they accepted or rejected the offer. The instructions explicitly indicated to Player 1s that Player 2s did not know the size of their endowment and that they could either tell the truth or lie about its size.

Results and discussion

All of the offers were accepted. NPV offerers lied over twice as much as Industrial Revolution offerers did (43% vs. 19%, Fisher's exact test, p = .04; see Fig. 2). As a result, the NPV offerers (M = \$6.32, SD = 1.40) earned significantly more money than the IR offerers did (M = \$5.65, SD = 1.14; $t(1,66)$ = 2.17; p = .03; Cohen's D = .53; see Fig. 2 and the Appendix).

Thus, in the first two experiments, completing the calculative NPV tutorial, which had no direct connection to participants' second task, led to a consistent increase in selfish behavior in the Dictator Game and lying in the modified Ultimatum game compared to completing the non-calculative, Industrial Revolution task; these self-regarding actions also led to higher monetary outcomes. These data support our prediction that engaging in a calculative task leads people to act both more self-interestedly and more unethically in a subsequent decision.

The NPV calculations, however, were both calculative and monetary. Since research has shown that merely reminding people of money reduces interpersonal sensitivity and increases self-interested behavior (Vohs, Mead, & Goode, 2006, 2008), the monetary nature of the NPV task may have influenced these results. Thus, Experiments 3 and 4 tested the effects of a set of non-monetary calculative and non-calculative tasks – the same GRE math and GRE verbal problems that we used in the pretest. An added benefit is that these two sets of tasks are potentially more comparable to each other than the NPV and IR tasks were.

Experiment 3

Experiment 3 followed the same procedures as Experiment 1 except that, instead of doing the NPV or the Industrial Revolution task, participants answered either the GRE math or the GRE verbal questions. Everyone had 15 min to solve as many problems as they could. Then 79 participants (half of the 158 we recruited) were randomly chosen to be dictators.

As noted, we also pretested the math and verbal questions to ensure that the math problems were not perceived as more difficult than the verbal problems (which might create stronger feelings of deservingness). An independent sample of 46 undergraduates completed both sets of problems and reported that both types of questions were similarly difficult (M_{math} = 4.24, SD = 1.16 vs. M_{verbal} = 3.90, SD = 1.37, $t(1,44)$ = .90, p = .38; Cohen's D = .27); they also indicated that they thought that they had done just as well on

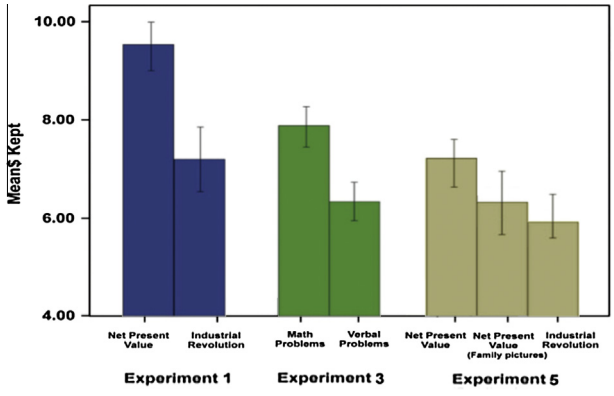

Fig. 1. Mean dollar amounts kept by dictators, out of \$10, in the Dictator Games in Experiments 1, 3, and 5.

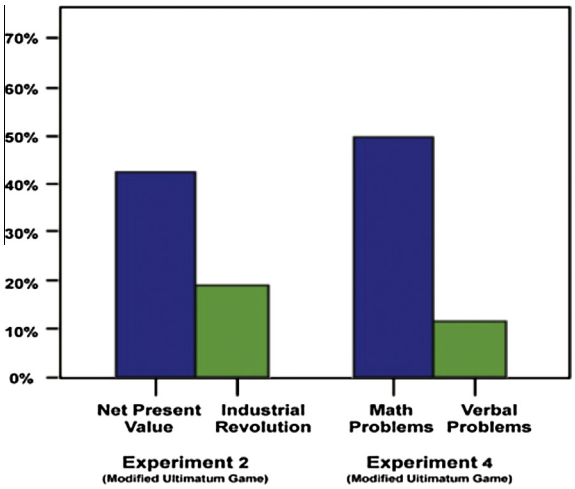

Fig. 2. Percentages of people who lied in Experiments 2 and 4.

one task as they had on the other (M_{math} = 3.56, SD = .87 vs. M_{verbal} = 3.95, SD = 1.80, $t(1,44)$ = .96, p = .34; Cohen's D = .28). This suggests that participants' decisions following the two tasks were not due to their difficulty or their expected performance.

Results

As predicted, dictators kept more money after doing math problems than they did after doing verbal problems (M = $7.44, SD = 2.12 vs. M = $6.39, SD = 1.97; $t(1,77)$ = 2.26, p = .026; Cohen's D = .51; see Fig. 1 and the Appendix). They also kept the entire $10 more than dictators who did the verbal problems, though not significantly more (32% vs. 18%, Fisher's exact, p = .20), and fewer of them offered equal splits (34% vs. 58%; Fisher's exact, p = .04).

Comparing the NPV dictators in Experiment 1 with the dictators in the current experiment suggests that the presence of money had effects over and above the effects of the act of calculating: the NPV-dictators kept significantly more money than the GRE math problem dictators did ($t(1,58)$ = 3.08, p = .003, Cohen's D = .89). The NPV-dictators were also more likely to keep the entire $10 (79% vs. 32%, Fisher's exact, p = .001) and were marginally less likely to offer equal splits (11% vs. 34%, Fisher's exact, p = .07) than the GRE math problem dictators did. These data suggest that the presence of money had an effect over and above the effects of the simple act of calculating on selfish behavior in Dictator Games.

Finally, comparing the no-first-task dictators and the additional, control condition in Experiment 1 with the two conditions in the Experiment 3 suggests that, as before, the math-verbal problem differences in money kept resulted because the math-problem dictators kept more (M = $7.44, SD = 2.12 vs. M = $6.44, SD = 2.06; Mann–Whitney test, Z = 2.07, p < .05), as money kept by the verbal-problem and control condition dictators did not differ significantly (M = $6.39, SD = 1.97 vs. M = $6.44, SD = 2.06; Mann–Whitney test, Z = .01, ns).

Experiment 4

Experiment 4 used the same GRE math and verbal problems to test whether non-monetary calculations would also lead people to lie more in the modified Ultimatum Game. Thus, this study started with the math and verbal problems from Experiment 3 and then used the same modified Ultimatum game that was used in Experiment 2 as the second task. Half of the 66 participants were randomly assigned to the role of Player 1s (offerers).

Results and discussion

As in Experiment 2, all of the offers were accepted. Player 1s who answered the math problems were four times more likely to lie (50% vs. 12%; Fisher's exact test, p = .03) than Player 1s who completed the verbal questions; they also received more money (M = $6.00, SD = 1.03 vs. M = $5.24, SD = .44; $t(1,31)$ = 2.8, p = .009, Cohen's D = .96; see Fig. 2 and the Appendix).

A comparison of the frequencies of lying by Experiment 2's NPV offerers with the math problem offerers in the current experiment led to no significant effects for the frequency of lies (43% vs. 50%; Fisher's exact test, p = .55) or for their monetary outcomes ($6.32 vs. $6.00; $t(1,51)$ = .83, p = .41; Cohen's D = .26). Thus, in terms of deceptive behavior, it appears that the monetary or non-monetary nature of a calculative task had little impact: either calculative task led to more lies and greater economic outcomes at the expense of others than the non-calculative tasks did, supporting the negative effects of calculations in both monetary and non-monetary contexts.

Although both Experiments 3 and 4 consistently demonstrated that engaging in a calculative task led to more unethical behavior, they provided mixed results regarding the effects of monetary vs. non-monetary calculations. Compared with non-monetary calculations, monetary calculations seem to have led to an increase in self-interested but not in unethical behavior. At the same time, all of these effects appear to be the result of a calculative mindset and a reduced consideration of social and moral values that emerge in other relational domains. If so, reminding people of these kinds of social values (e.g., communal sharing; Fiske, 1992) should reduce or even eliminate these negative effects. Thus, Experiment 5 tested this prediction by introducing a simple intervention between the calculative or non-calculative task and the final strategic task. In addition, we also tested two possible mechanisms.

Experiment 5[2]

We suggested earlier that calculations might increase self-interested and unethical behaviors because engaging in these tasks increases utilitarianism and reduces moral emotions. Experiment 5 tested these predictions in two ways. First, if engaging in calculations reduces people's social and moral considerations by narrowing the scope of their social relations (i.e., reducing communal sharing) and limiting the influence of moral emotions, we expected that an intervention that increases people's awareness of broader social values and principles and sensitizes them to emotions would reduce the unintended negative effects of a calculative mindset. Because communal sharing in families represents both an important moral symbol (Tetlock et al., 2000) and elicits rich emotions (e.g., love and empathy), we tested whether showing participants photos of families would reduce the negative consequences of a calculative mindset. Second, we explicitly measured utilitarianism and emotions and tested their involvement in the relationship between calculations and self-interested decisions.

Participants and design

We recruited 165[3] participants, 67.3% female, averaging 20.20 years of age, from the same subject pool; they each received an $8 participation fee plus their payoff from the Dictator game. The design was a 2 (NPV vs. Industrial Revolution task) × 2 (family picture vs. none) factorial. As before, participants were randomly assigned to either the NPV or the Industrial Revolution (IR) tutorial for their first task.

We made small revisions in both tutorials: the examples in the NPV tutorial described a family business and a note in the IR tutorial indicated that it was written by a family of business writers. This provided a simple justification for their second task: after completing the NPV or the IR task, participants were presented with four family photographs and were asked to choose which of the four families owned the business described in the NPV tutorial or had written the IR tutorial. Half of the participants did the "family photo" task before doing the Dictator game; half did not.

Participants then rated how much they liked the tutorial. To check whether the family photos and/or the NPV/IR tutorials might change participants' moods, we asked them to respond to an abbreviated 8-item version of PANAS scale[4] before they played

[2] We also ran a similar experiment with online calculative tasks. Due to limited control, the online calculative tasks did not lead to the same significant calculative effect. However, combining the data in that study with Study 5's continued to reveal the same calculative effect we have observed in our other studies. We report the results of this online experiment in the online Supplemental mateirals.

[3] Nine participants were excluded because they questioned the existence of the other party or did not complete the first task correctly.

[4] The abbreviated PANAS scale did not show good construct validity: some items were not reliably correlated with each other for either positive or negative affectivity. Analyzing this less reliable scale suggested that participants' pre-dictator game moods were only related to non-calculative (IR) dictators' decisions but not calculative (NPV) dictators' decisions. Although these analyses indirectly corroborate some of our results on how the calculative task might lead to less emotional decisions, we do not report them here because of the unreliability of the scale.

Study 1's Dictator Game. Finally, they answered a series of questions about their decision as a dictator as well as three sets of questions measuring their emotional reactions toward their dictator decision and asking them to make several utilitarian judgments.

Measures

Utilitarianism. We adapted 7 of Bartels and Pizarro's (2011) 14 moral dilemmas as measures of utilitarian responses. The seven dilemmas ranged from sacrificing 100 soldiers to win a battle to damaging the health of 200 children to save the lives of 1800 other children. After reading each dilemma, participants indicated, on a 4-point scale (from −2 = *No* to 2 = *Yes*; 0 is not in the scale), whether they would choose the more utilitarian or the more deontological option. Like Bartels and Pizarro (2011), we averaged their responses across the 7 dilemmas (analyzing them individually led to similar results).

To broaden our analyses, we also included an additional measure of consequentialism. Consequentialism and utilitarianism are closely related. Strictly speaking, utilitarianism is a subset of consequentialism. Consequentialist analyses determine what is right or wrong based on a decision's consequences, and the determination of costs and benefits can often be calculative – not, however, when people simplify their evaluations by only considering a decision's primary positive/negative consequences. Thus, although consequentialism and utilitarianism can both be analytic, they can lead to different forms of numerical evaluations, with consequentialist analyses using a general evaluative approach that does not require formal, quantitative analysis. Both approaches, however, are inconsistent with deontological morality (e.g., Anscombe, 1958). To make sure that it is utilitarian thinking and not general consequentialist thinking that underlies the effects of a calculative mindset, we adapted Tanner, Medin, and Iliev's (2007) 8-item scale of consequentialist thinking and added 4 new, similar items. Each item asked participants to indicate their agreement with consequentialist (e.g., "Moral compromises are always necessary when doing so creates better outcomes.") or deontological statements (e.g., "People should not make concessions on their core moral values.") on 5 = point scales (1 = *Strongly disagree*; 5 = *Strong agree*). We averaged their highly correlated responses to form a consequentialist thinking index (α = .73).

Emotional reactions toward their dictator decision. It can be difficult to directly measure people's emotional states while they are making decisions, as questions about emotional states can alter the decision process. As a result, we asked participants' to explain their decision in two open-ended questions right after they finished the Dictator Game. Then we immediately asked them to report their emotional reactions to their decision in two straightforward questions: "How do you feel about your decision?" (on a 7-point scale from 1 = *bad* to 7 = *good*), and "Do you regret the choice you just made?" (on a 7-point scale from 1 = *not at all* to 7 = *very much*; reverse coded). If a calculative mindset limits the role of emotions in decision making, as we have predicted, then people who have made selfish offers should be less emotionally bothered by their decisions when they engaged in calculations than when they did not. Responses to these two items were highly correlated. Thus, we averaged them to form an index of their emotional reactions to their dictator decisions (α = .73).

Results

As before, the calculative (NPV) task led people to be more selfish in the Dictator Game. It also increased (marginally) their utilitarian judgments, which led to a marginal increase in the money they kept as dictators. In addition, the social intervention of the family pictures reduced the money they kept, also marginally, after participants completed the calculative task. Finally, the calculative task seemed to affect people's natural emotional reactions. The calculative (NPV) dictators felt more positively and less regretful than the non-calculative (IR) dictators did when they kept more than half of their endowments.

Calculations and the family photo intervention. The NPV task again led people to keep significantly more money (M = \$6.75, SD = 2.13) than the Industrial Revolution task did (M = \$5.96, SD = 2.00; $t(1,163) = 2.43$, $p = .016$; Cohen's $D = .38$). Testing whether exposure to the family photos moderated the effects of a calculative mindset on dictators' choices, in a 2 (NPV/Industrial revolution task) × 2 (Family picture/not) analysis of variance (ANOVA) on the amount of money dictators kept, led to a significant effect for the task ($F(1,161) = 5.59$, $p = .019$; $\eta^2 = .03$) but not for the effects of the family picture ($F(1,161) = 1.79$, $p = .18$; $\eta^2 = .01$) or the interaction ($F(1,161) = 1.55$, $p = .22$; $\eta^2 = .01$). The introduction of the family photos, however, did lead to a marginal reduction in the average dictator offers in the NPV condition: the difference between the NPV-no family photo and the NPV-family photo conditions was marginally significant: M = \$7.14, SD = 2.29 vs. M = \$6.31, SD = 1.87, respectively; $t(1,81) = 1.82$, $p = .07$; Cohen's $D = .40$; see Fig. 1 and the Appendix). This indicates that a subtle stimulation of social awareness marginally reduced the selfish effects of a calculative mindset.

Utilitarianism. The calculative (NPV) task also increased participants' utilitarian judgments, marginally (M = .48, SD = .56 vs. M = .30, SD = .64, $t(1,162) = 1.96$, $p = .051$; Cohen's $D = .30$); it did not influence their consequentialist thinking (M = 2.77, SD = .52 vs. M = 2.81, SD = .46, $t(1,162) = .54$, $p = .59$; Cohen's $D = -.08$). In addition, participants' utilitarian judgments were marginally related to the money they kept as dictators ($r = .14$, $p = .087$); their consequentialist thinking was not ($r = .06$, $p = .43$). A 2 (NPV/IR task) × 2 (Equal share vs. not) ANOVA on participants' utilitarian judgments only revealed a marginally significant main effect for the task ($F(1,157) = 1.20$, $p = .07$; $\eta^2 = .02$); the interaction ($F(1,157) = .25$, $p = .61$; $\eta^2 = .00$) and whether they shared money equally were not significant ($F(1,157) = 2.06$, $p = .15$; $\eta^2 = .01$). Compared with dictators who offered an equal split, people who kept more money were marginally more utilitarian in their judgments (M = .48, SD = .55 vs. M = .32, SD = .65, $t(1,159) = 1.77$, $p = .08$; Cohen's $D = .27$), suggesting that utilitarian judgments were related to a marginal increase in the money that participants kept.

These results suggest that the calculative task had a marginal impact on people's utilitarian judgments, which had a marginal impact on their decisions to keep more money. Although this pattern is consistent with our expectations, the relatively weak effects support our predictions only moderately.

Post-dictator emotional reactions. A 2 (NPV/Industrial revolution task) × 2 (Equal share vs. not) ANOVA on participants' post-dictator feelings led to a significant effect for money kept ($F(1,159) = 93.72$, $p < .001$; $\eta^2 = .37$), a significant interaction ($F(1,159) = 4.16$, $p = .043$; $\eta^2 = .03$), and a marginally significantly effect for the NPV/IR task ($F(1,159) = 2.88$, $p = .09$; $\eta^2 = .02$). Overall, people who kept more money felt worse about their decision than people who offered an equal split (M = 4.75, SD = 1.25 vs. M = 6.33, SD = .90, $t(1,161) = 8.97$, $p < .0001$; Cohen's $D = 1.45$). In contrast, dictators who shared equally felt very positive afterwards, whether they had done the NPV task (M = 6.30, SD = .81) or the IR task (M = 6.36, SD = .98; $t(1,90) = -.31$, $p = .76$; Cohen's $D = .07$).

The significant interaction paints a fairly clear picture of the effects of the calculative task on participants' emotional reactions: NPV dictators who kept more than half of their endowment felt

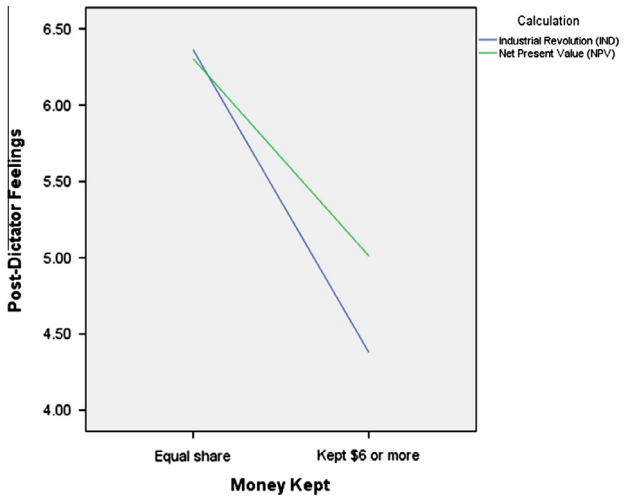

Fig. 3. Post-dictator emotions as a function of the money participants kept (equal share vs. $6 or more) in the Dictator Game in Experiment 5.

significantly more positively and less regretful about their decision than the Industrial Revolution dictators participants who kept more than half of their endowment did ($M = 5.01$, $SD = 1.30$ vs. $M = 4.38$, $SD = 1.12$, $t(1,69) = 2.19$, $p < .05$; Cohen's $D = .52$; (see Fig. 3).

These data also suggest the IR dictators who kept more than half of the money felt worse ($M = 4.38$, $SD = 1.12$) than any of our other dictators did (all p's < .05). In contrast, the NPV dictators who kept more money for themselves still felt relatively positive and unremorseful ($M = 5.01$, $SD = 1.30$). In other words, post-decision emotions were related to the non-calculative (IR) dictators' decisions but they seemed to play a less important role for the calculative (NPV) dictators' decisions. Although the post-choice emotion measures cannot directly test whether a calculative mindset limited the role of emotional influence, thereby leading to self-interested behaviors, these results suggest that the calculative task dampened people's natural emotional reactions and resulted in dictator decisions that were independent of their emotions.

General discussion

The current research has identified and investigated an important aspect of organizational decision making – calculations – and has consistently shown that it can have unintendedly negative consequences. After engaging in a calculative task, people in our experiments were increasingly likely to succumb to the temptations of higher payoffs by acting more selfishly or dishonestly. Thus, just as extrinsic, monetary outcomes can crowd out inherent interest in a task (Deci & Ryan, 1985; Frey & Jegen, 2001), it appears that the mere act of calculating can activate a calculative mindset that crowds out social and moral concerns, resulting in more self-interested, and even immoral behavior. This suggests that a calculative approach to problems is not value-free. It is impossible to determine (post hoc) whether these below-the-surface calculative effects might have contributed to corporate scandals. But the classic case of the Ford Pinto and Ford's callous cost–benefit calculations provide one salient example, as their analysts calculated that they could save $11 per car, at a cost of only 180 potential burn deaths (Birch & Fielder, 1994).

Our research also suggests that a calculative mindset may be more detrimental than other types of deliberative thinking. Zhong (2011) compared the effects of deliberative decision making to intuitive decision making, finding that deliberative decision making can increase unethical behavior. Our results extend Zhong (2011) by showing that not only does deliberation matter, but the content of deliberation also matters. Our participants engaged in deliberative thinking in both conditions: people in the NPV or GRE math conditions deliberated (and calculated) numerically, whereas people in the IR or GRE verbal conditions deliberated about social historic or linguistic knowledge, without any numerical calculations. People in the calculative conditions were not only more selfish compared to people in the non-calculative conditions, they were also more likely to lie or cheat. Thus, a calculative mindset, a special kind of deliberation, seems to have particularly negative (but unintended) effects on ethical decision making.

These findings are also consistent with research on brain activation during arithmetic and non-arithmetic tasks. Both calculative and non-calculative tasks activate some cortical networks but not others, suggesting that some regions of the brain are devoted to general cognitive activity and others are more strictly devoted to calculations (Gruber, Indefrey, Steinmetz, & Kleinschmidt, 2001). Organizational decisions can activate many kinds of thinking. A narrowly focused "crunch the numbers" approach, however, seems to direct people's attention to calculative deliberation. Thus, our results offer insights into why otherwise moral individuals sometimes may 'fall off the wagon' and engage in calculatively immoral acts (e.g., Bersoff, 1999; Jordan, Mullen, & Murnighan, 2011; Kidder, 2009). For example, wanton greed may not have been alone in contributing to the recent string of financial scandals, as all of these events shared a less obvious characteristic, i.e., extensive calculations. Obviously, a suggestion that the mere act of calculating helped to fuel these massive deceits moves far beyond our data. Nevertheless, if these effects do apply in high stakes contexts, it may not be the sole allure of money that encourages these kinds of unethical acts.

The current findings also suggest a new set of explanations for a variety of observations on the effects of a business school education. Several scholars have pointed to the field of economics and to business schools as primary contributors to the incidence of unethical corporate activity (e.g., Adler, 2002). Marwell and Ames (1981), for instance, found that first-year economics graduate students contributed only half as often as non-economics students did in a public goods game; they were also more likely to free ride. Frank et al. (1993) and Rubinstein (2006) observed conceptually similar effects in prisoner's dilemma games and other economic contexts. Scholars have typically explained these findings by suggesting that economics' assumption of self-interest maximization encourages people to act selfishly and greedily (e.g., Ghoshal, 2005; Pfeffer, 2005; Wang & Murnighan, 2011). The current findings suggest that these observations may have also resulted from economics' focus on calculative analysis as the best method for achieving rational outcomes. As Williamson (1993) noted, "a failure to appreciate the limits of calculativeness purportedly gives rise to excesses."

The finding that people's ethical decisions vary as a result of different mindsets activated by organizational tasks suggests that the kinds of rational consistency that people often strive for may be fleeting (e.g., Camus, 1946). Nevertheless, room for optimism still remains. In particular, the simple act of viewing and choosing among four family photographs diminished the effects of the calculative task, not significantly but noticeably.[5] Thus, the simple act of posting pictures of families around an organization's offices

[5] In two prior, less comprehensive experiments, in which participants saw and chose from among the same four family photographs, as they did in Experiment 5, we observed an elimination of the effects of the calculative task, in both the Dictator Game and the modified Ultimatum Game. We report the results of these two experiments in the online Supplemental materials.

might be enough to awaken social and moral awareness and avoid the negative consequences of a calculative mindset. Given the subtlety of our manipulations, these effects might be even stronger when people's social mindsets are more directly activated. For example, organizations might consider directly instilling more family and/or social values into their decision making processes (e.g., "Think about your family and friends before making any moral decisions."). A large scale implementation of this idea would make for a particularly interesting study.

In addition, the fluidity with which people's brains seem to shift from one topic to another opens up a wide array of potential responses that allow them to retain some consistency with the moral identities that they try to create for themselves (e.g., Aquino & Reed, 2002). Thus, as dual process models in psychology (e.g., Kahneman, 2003; Stanovich & West, 2002) suggest, decision makers can engage in a mix of rule-based, analytical, and explicit thought processes, as well as preconscious, effortless, automatic, and intuitive cognitive processes. Past research, however, has not yet provided completely consistent evidence about the effects of dual processes on people's moral decisions. Both Zhong (2011) and Rand et al. (2012), for example, found that people tended to be intuitively ethical or cooperative, unless they take time to deliberate, which led them to be more self-interested and immoral. Gunia, Wang, Huang, Wang, and Murnighan (2012) and Shalvi, Eldar, and Bereby-Meyer (2012), in contrast, showed exactly the opposite effects as contemplation in their studies led to less instead of more deception than immediate decisions did. Thus, future research may need to identify a variety of additional forces that influence organizational decision makers' moral decision processes.

Limitations and future research

The current research, like any set of studies, has its own idiosyncratic limitations. Although we used two different sets of calculative tasks, both monetary and non-monetary, they may have had particular characteristics that contributed to the results, as might the characteristics of their comparison sets, i.e., the non-calculative tasks. Thus, different calculative and non-calculative tasks might activate different mindsets and have different moral implications. Future research might investigate these potential differences (e.g., their cognitive demands) and the related effects of different calculative and non-calculative mindsets.

Although our last study investigated both utilitarianism and emotional reactions as possible mechanisms, as well as the influence of family pictures as a potential moderator, the results provided only suggestive rather than conclusive support for our predictions. In particular, participants' utilitarian judgments and the family photo intervention only had marginal effects on their selfish actions. In addition, how to directly test whether a calculative mindset limited the role of emotional influence in moral decision making processes opens up new research questions. Future work might further investigate these and other related mechanisms to better understand the impact of these phenomena.

Finally, contextual factors might also moderate the current effects. Research suggests, for example, that people act more ethically as they get older (Ruegger & King, 1992); thus, the current findings might be weaker for older respondents, although it would be worthwhile to conduct pointed research to determine whether this continues to be true following calculative tasks. Similarly, the use of field experiments rather than concentrating in the lab could increase confidence in the current findings, as could an even broader range of strategic games as measures of social and moral behavior. That said, these particular games have been used extensively in research, in part because they are so involving: participants always seem to be particularly attuned to the strategic nature of each of these tasks.

Conclusion

Calculations are ubiquitous and necessary for many different kinds of decisions. Williamson (1993) suggested that understanding the limitations of calculativeness can help extend the analytical reach of a calculative approach. The current results identify some of these limits, showing that the subtle emphasis of a calculative, market-pricing approach can not only lead to less communal sharing of a monetary resource – it can also lead to unethical behavior. Fortunately, the results also show that a subtle introduction of social values may be able to dampen these effects. This suggests that future research might focus on how to best design direct, effective, and consistent methods for incorporating social and moral values into economic calculations.

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Appendix A

Sample sizes, the mean amounts kept, and standard deviations in the Dictator Games in Experiments 1, 3, and 5.

Experiment/(treatment)	*N*		Mean $ kept		Std. deviations	
	Calc. task	Non-calc. task	Calc. task	Non-calc. task	Calc. task	Non-calc. task
Expt. 1	19	17	9.16	6.88	1.74	2.11
Expt. 3	41	38	7.44	6.39	2.12	1.97
Expt. 5	83	82	6.75	5.96	2.12	2.00
Expt. 5 (social intervention)	39	38	6.31	5.95	1.87	2.08
Expt. 5 (no social intervention)	44	44	7.14	5.98	2.29	1.96

Sample sizes, the frequencies and percentages of lies and the means and standard deviations of the final outcomes in the (modified) Ultimatum Games in Experiments 2 and 4.

Experiment/treatment	*N*		% Lies		Mean $ obtained		Std. deviations	
	Calc. task	Non-calc. task	Calc. task	Non-calc. task	Calc. task	Non-calc. task	Calc. task	Non-calc. task
Expt. 2 Ultimatum Game	37	31	43	19	6.32	5.65	1.40	1.14
Expt. 4 Ultimatum Game	16	17	50	12	6.00	5.24	1.03	0.44

Appendix B. Supplementary material

Supplementary data associated with this article can be found, in the online version, at http://dx.doi.org/10.1016/j.obhdp.2014.05.004.

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