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Reference Points and Omission Bias

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Subjects were asked to evaluate the choice of options leading to known outcomes, or to say how they would feel about a chance outcome, in hypothetical decisions. We independently manipulated the value of the status quo and the assignment of the better or worse outcome to an act or an omission. Acts leading to the worse outcome were always considered worse than omissions leading to the worse outcome. This act–omission difference was reduced or reversed for the better outcome. Most experiments showed an overall bias toward omissions (combining better and worse). Little evidence was found for greater omission bias for losses relative to the status quo than for gains. A bias toward maintaining the status quo itself was found, however, independently of omission bias. Most of the results can be explained by norm theory and by loss aversion, but other possible accounts are inconsistent with the results. © 1994 Academic Press, Inc.

People often judge acts to be worse than omissions with the same consequences. Many people will not terminate life-sustaining medical treatment, although they would not initiate such treatment for an otherwise identical case. Likewise, it was argued that hurricanes should not be seeded, even if the total harm would be reduced, because different people would be hurt by the seeded hurricane, and the decision makers would be responsible for this harm (Howard, Matheson, & North, 1972). Our legal system honors the distinction even when it seems irrelevant: pharmaceutical companies are held liable for the harm caused even by well-produced, compulsory vaccines, but not for the harm caused by failing to produce vaccines (Inglehart, 1987). Many countries have no laws against failure to rescue (Feldbrugge, 1966). More generally, we tend not to hold

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ourselves responsible for harm that we could easily prevent (Singer, 1979).

These examples suggest the operation of a general bias in decision making, a systematic failure to make decisions in ways that best achieve people's goals concerning outcomes. This bias occurs even when people are aware of it. Arguments that it is a bias can therefore not depend on demonstrations that people violate decision rules that they themselves endorse. Rather, it is a bias because it prevents us from achieving our goals (Baron, 1993, 1994).

Empirical research supports the existence of this bias. Sugarman (1986) found that subjects judged active euthanasia as worse than passive euthanasia. Sugarman asked about "responsibility," however, which could be interpreted as a legal question rather than one about morality or advisability. Spranca, Minsk, and Baron (1991) avoided this problem and still found a bias toward harmful omission. In one case, for example, subjects were told about John, a tennis player who thought he could beat Ivan Lendl only if Lendl were ill. John knew that Ivan was allergic to cayenne pepper, so, when John and Ivan went out to the customary dinner before their match, John planned to recommend to Ivan the house salad dressing, which contained cayenne pepper. Subjects were asked to compare John's morality in different endings to the story. In one ending, John recommended the dressing. In another ending, John was about to recommend the dressing when Ivan chose it for himself, and John said nothing. Ten out of 33 subjects thought that John's behavior was worse in the commission ending, and no subject thought that the omission was worse.

Ritov and Baron (1990) examined a set of hypothetical vaccination decisions. We compared omission and commission as options within the same choice. In one experiment, subjects were told to imagine that their child had a 10 out of 10,000 chance of death from a flu epidemic, a vaccine could prevent the flu, but the vaccine itself could kill some number of children. Subjects were asked to indicate the maximum overall death rate for vaccinated children for which they would be willing to vaccinate their child. Most subjects answered well below 9 per 10,000. Of the subjects who showed this kind of reluctance, the mean tolerable risk was about 5 out of 10,000, that is, half the risk of the illness itself. Some subjects would accept no risk at all from the vaccine. Asch, Baron, Hershey, Kunreuther, Meszaros, Ritov, and Spranca (in press) found that the existence of this bias correlated with mothers' resistance toward DPT vaccination (which may produce death or permanent damage in a few children).

In these cases, the action and omission options being compared always lead to bad outcomes compared to the status quo. (In the status quo, Lendl is not sick and all children are alive.) Another kind of decision has

been studied in which two attributes of an outcome trade off so that an improvement in one could be compensated by a decrement in the other. For example, in most monetary transactions, money is given up in return for some good, or vice versa.

A common finding in these situations is that people tend toward inaction or toward the status quo. They require more money to give up a good than they are willing to pay for the same good (Knetsch & Sinden, 1984; Samuelson & Zeckhauser, 1988; Viscusi, Magat, & Huber, 1987). In studies of valuation of public goods, willingness to accept (the amount of money required for giving up a good) exceeds willingness to pay (for the good) (Mitchell & Carson, 1989). Kahneman, Knetsch, and Thaler (1991) showed that these effects were not the result of wealth effects or other artifacts. They are, at least in part, true biases.

In all of these studies, keeping the status quo requires no action, and changing the status quo requires action. Ritov and Baron (1992) found that the status quo bias—the attachment to the status quo that is common to all of these findings—was largely a consequence of omission bias. Specifically, when subjects were told that keeping the status quo required action and that giving it up required inaction, subjects then favored giving up the status quo. When both options required action, no preference for the status quo was found, but when both options yielded new outcomes (neither one matching the status quo), a preference for omissions was still found. Schweitzer (in press) found both omission bias without a status quo option, thereby supporting our conclusion that this bias is not dependent on the status quo bias, and status quo bias without an omission option, a result that we did not find. His results suggest that the status quo bias as usually measured consists of two different effects, a bias toward omissions, and (in some cases) a bias toward the status quo.

In sum, omission bias has been found in three different ways: First, subjects judge omissions leading to the worse outcome as less bad than acts leading to the same outcome (as in the Lendl case). This result requires comparisons of options in different choice sets; only in this way is it possible for the worse of the same two outcomes to be caused by an act in one case an an omission in the other. Second, subjects sometimes judge harmful acts to be worse than *more* harmful omissions within the same choice set (as in the vaccine cases). We shall call this result a "reversal," since the act–outcome distinction reverses the ordering of options from what it would otherwise be. Third, subjects judge omission to be better than acting to bring about an equally desirable outcome that is better in one way but worse in another way. We shall call this situation a "tradeoff." All the results described so far involve outcomes that can be seen as bad in some way. Later we shall review other results concerning outcomes that are good.

The aim of the present paper is to explore the possible explanations of these findings in terms of comparisons of outcomes to reference points. We do not assume that this is the only way to explain these results. Other explanations could involve the use of heuristics such as "let nature take its course." Even such heuristics, however, may operate through comparison of outcomes to reference points, such as the effect of nature.

EXPLANATIONS OF OMISSION AND STATUS-QUO BIASES

Mechanisms that could explain these effects differ in their assumptions about the reference point that is used and about whether some outcomes or options are weighed more heavily than others. Some possible reference points are the status quo and the outcome of the omission option. Both options could be compared to the same reference point, but it is also possible that acts are compared to the status quo whereas omissions are compared to themselves or not evaluated. Losses could be weighed more heavily than gains, or the act (or its outcomes) could be weighed more heavily than the omission (or its outcomes). All of the explanations considered can explain the basic finding of the Lendl story, but we shall review other findings that are consistent with some mechanisms but not others.

Norm-Theory

Kahneman and Miller (1986, p. 145) suggested that "the affective response to an event is enhanced if its causes are abnormal" and that acts are considered abnormal because "it is usually easier to imagine abstaining from actions that one has carried out than carrying out actions that were not in fact performed." This account was suggested by the finding of Kahneman and Tversky (1982) that subjects anticipated more regret when bad outcomes resulted from action (e.g., buying the less profitable of two stocks) than when they resulted from omission (failing to buy the more profitable stock). We interpret norm theory as asserting that the omission is the reference point: $u(O,X) = 0$ for all X, where O represents an omission and X represents the outcome. Acts leading to the worse outcome are seen as worse than any omission (whether from the same choice set or a different choice set), and acts leading to the better outcome are seen as better than any omission. More generally—if the use of omission as the reference point were true only some of the time, or if it were a kind of argument that pulls subjects' evaluations in a certain direction—omission bias for the worse outcome should be greater than that for the better outcome. That is, an interaction is predicted between better vs worse and act vs omission. This is often called an amplification effect: acts are amplified.

Landman (1987) and Gleicher *et al.* (1990) found that anticipated joy in

response to positive outcomes was stronger when the outcomes were the result of action rather than inaction. In these studies, as in Kahneman and Tversky (1982), the outcome was uncertain, and the better vs worse distinction resulted from chance. Spranca *et al.* (1991, Experiment 3) found evidence for better vs worse difference in omission bias in the evaluation of decisions with known outcomes: A train was rolling down a track toward a switch. On one branch of the track after the switch, two men were working; on the other branch, three men. Subjects evaluated four decisions: the train was rolling toward three men and the agent switched it to two ($A, -2$); the agent did not switch the train ($O, -3$); the train was rolling toward two and the agent switched it to three ($A, -3$); the agent did not switch to three ($O, -2$). Most subjects ranked $A, -3$ worse than $O, -3$, but subjects were about equally divided on whether $O, -2$ was better or worse than $A, -2$, and many subjects rated them equal. Better and worse outcomes were clearly treated differently. This result, however, could also be explained if $A, -3$ was perceived as intentional endangering of an extra person whereas $O, -3$ was not.

Loss-Aversion

The simple assumption that omission is the reference point cannot explain omission bias in tradeoffs (e.g., Ritov & Baron, 1992). We can explain this result, however, if we add the loss-aversion assumption that losses are weighed more heavily than equivalent gains (Kahneman & Tversky, 1979; Tversky & Kahneman, 1991). The commission option is represented as a gain in one dimension and a loss in the other, relative to the omission (default), which is taken as the reference point. Because the negative utility of losses is greater than the utility of equivalent gains, people will prefer the default (Thaler, 1980). For example, money paid out is valued more highly than money received, and a good given up is valued more than a good received, so people who are unwilling to spend $\$X$ for a good will not accept $\$2X$ for the same good.

This same account can explain reversals, if outcomes are perceived in terms of different dimensions. For example, in the vaccination case of Ritov and Baron (1990), deaths from the vaccine and deaths from the disease may be considered as different dimensions. Compared to the omission, the act increases vaccine deaths but decreases disease deaths. Consistent with this account is the finding that omission bias was sharply reduced when subjects were told that the children who would die from the vaccine were the same ones who would have died anyway from the flu; this instruction may have encouraged subjects to think of the outcomes as one dimensional. Loss aversion, however, cannot explain extreme reversals in which subjects are willing to accept no risk at all from the vaccine, unless gains are given no weight relative to losses.

Loss aversion can also explain the results of Experiment 4 of Spranca *et al.* (1991), where a medical treatment removed the risk of brain damage from disease but incurred its own risk. The risk was 15% for the treatment and 20% for the disease, or the reverse. Subjects rated each option in each choice set on a scale of -100 (bad) to 100 (good). Omissions leading to the worse outcome (20%) were rated higher than acts leading to that outcome, and omissions leading to the *better* outcome (15%) were also rated higher than acts leading to that outcome. An act leading to the better outcome would be seen as trading a 20% gain in disease risk for a 15% loss of treatment risk, so loss aversion would still lead to a lower rating than for the omission. Consistent with this account, more zero ratings were assigned to omissions than to acts, as would be predicted if the omission were often taken as the reference point, and mean ratings were higher overall when the worse option was an omission than when the worse option was an act. (A somewhat different account was provided by Spranca *et al.*)

The same experiment also found the interaction predicted by norm theory. Spranca *et al.* (1991) reported no such interaction, but a reanalysis of their data finds a modest but significant effect when it is tested directly by comparing the omission bias for better vs worse outcomes ($t(47) = 2.03$, $p = .048$; it was originally tested as an interaction an analysis of variance in which order was a factor, but order did not affect the size of the interaction significantly.

Unequal Weighting

Another account holds that outcomes are compared to the perceived status quo (or some other salient reference point) rather than to the omission. Acts are simply weighed more heavily, perhaps because more attention is paid to them. In the extreme, omissions are not evaluated at all. (Omissions are also not evaluated according to norm theory, but that is because they are the reference point.[1]) This account predicts a greater omission bias for losses than for gains, where gain and loss are defined relative to the status quo. If no other mechanism were operating, acts would be considered better than omissions for gains over the status quo, as well as being considered worse than omissions for losses.

Whether reversals were found for losses would depend on the weights and the outcomes. For example, if acts were weighed more than twice as much as omissions, and if utility were linear, then $u(\mathrm{A}, -5) < u(O, -10)$, but, if acts were weighed less than twice as much as omissions, then

[1] Another case of failure to evaluate outcomes may occur in the neglect of opportunity costs (e.g., Becker *et al.*, 1974). Opportunity costs are described as foregone gains relative to the status quo.

$u(A, -5) > u(O, -10)$. (The outcomes are defined relative to the status quo.) If omissions were given no weight, then $u(O, -10) = 0$, and $u(A, -X)$ would always be lower for any $X > 0$. In Ritov and Baron's (1990) study, many subjects were willing to tolerate some risk from the vaccination, but others were not wiling to tolerate any risk. The former may have been giving some weight to the outcome of the omission (compared to the status quo), while the latter were giving no weight at all to it, simply evaluating the effect of the act relative to the status quo.

Unequal weighting can account for Landman's (1987) results, if subjects perceived the outcomes as losses compared to the status quo or some other reference point. Unequal weighting by itself cannot account for omission bias in tradeoffs unless both options are worse than the status quo.

The main purpose of the present studies is to manipulate systematically the relation of outcomes to each other and to the status quo. We manipulate gains vs losses (relative to the status quo) and better vs worse independently by manipulating the status quo independently of the outcomes. In this way, we can distinguish unequal weighting, in which the status quo plays a special role, from other accounts, in which it does not. We also examined a variety of different scenarios. Finally, some previous studies have examined emotional reactions, and others have examined judgments of decision quality or advisability. We examined both, sometimes in the same experiment.

EXPERIMENT 1

The first experiment was a replication of Gleicher *et al.* (1990), Kahneman and Tversky (1982), and Landman (1987), except that our cases had a clear status quo, different from both the act and the omission. We could therefore examine omission bias as a function of gain vs loss (relative to the status quo) as well as a function of better vs worse.

Subjects were told about a decision involving either switching or not switching an investment. They were told the outcomes of both options, regardless of which one the agent chose. Both outcomes were either gains or losses relative to the status quo, but one outcome was better than the other. The subject was asked to compare the feelings of two agents who reached the same outcome out of the same pair of possible outcomes, one agent reaching the outcome through an act and the other through an omission.

Method

Sixty-two subjects in a class at Ben-Gurion University were given a questionnaire describing four pairs of descriptions of situations. "In each pair of descriptions the final situation of both people is identical, but the

way in which they reached this situation is different." Subjects were asked to "read the descriptions carefully and try to imagine how each of them feels. For each pair of descriptions . . . indicate which one of these two people feels better (or less bad) at the end." Subjects were discouraged from indicating that the two people feel the same. The first pair read (in translation from Hebrew):

> X owns shares of company A. During the past year he considered switching to shares of company B, bud decided not to do so. At the end of the year he finds out that his shares in company A have earned a net profit of 6000 shekels. Had he switched to shares of company B his net profit would have been 4000 shekels higher (that is, his net profit would have been 10,000).
>
> Y owned shares of company A. During the past year he switched to shares of company B. At the end of the year he finds out that his shares in company B have earned a net profit of 6000 shekels. Had he kept his shares in company A his net profit would have been 4000 shekels higher (that is, his net profit would have been 10,000).

Note that the two cases were the same except for whether the outcome resulted from an act or an omission. In this pair, the outcome was the *worse* of the two possible outcomes, but each possible outcome was a *gain*. In another pair, the outcome was the *better* of the two, and both were gains. The two other pairs were loss-worse and loss-better. The four pairs were presented in four different orders for counterbalancing, and the order of act vs omission within each pair was likewise counterbalanced. Roughly equal numbers of subjects were randomly assigned to each possible order.

Results

Order did not affect any of the measures. Table 1 shows the number (and percentage) of subjects in each condition who thought that the omission or act would lead to feeling better (or less bad).

When the outcome was the worse of the two possible outcomes, the omission led to better (less bad) feeling ($p = .005$ for gain-worse, $p = .003$ for loss-worse, by two-tailed sign tests). When the outcome was the better

TABLE 1
NUMBER (PERCENTAGE) OF SUBJECTS IN EACH CONDITION OF EXPERIMENT 1 WHO THOUGHT THAT THE OMISSION OR ACT WOULD LEAD TO BETTER (OR LESS BAD) FEELING

	Condition			
Option	Gain-worse	Loss-worse	Gain-better	Loss-better
Omission	42 (67.7%)	42 (67.7%)	24 (38.7%)	24 (38.7%)
Act	19 (30.6%)	18 (29.0%)	36 (58.1%)	34 (54.8%)
Equal	1 (1.6%)	2 (3.2%)	2 (3.2%)	4 (6.5%)

one, the act tended to lead to better feeling, but not significantly so. Overall, combining both Better and Worse conditions, the tendency of omissions to lead to better feeling is not quite significant (p = .061, two-tailed sign test across subjects on whether omission or act is favored more often). Differences among the four conditions were significant (p = .004, Friedman test), each Better condition differed from each Worse condition in the relative ranking of act and omission (p = .005 or less for the four comparisons, Wilcoxon test), and the two remaining Gain vs Loss comparisons did not differ significantly.

In sum, the results did not support the prediction of unequal weighting that omission bias would be greater for losses than for gains, but they did support the prediction of norm theory that the bias would be greater for worse outcomes than for better outcomes. For the worse of the two possible outcomes, the act led to more negative feeling than does the omission.

EXPERIMENT 2

Experiment 2 examined two different kinds of decisions, one concerning pension funds (which differed in interest rates) and another concerning trade policies (which affected unemployment rates in a particular industry). Outcomes varied in their relation to the status quo and their relation to each other, as in Experiment 1. Here, however, subjects made two different kinds of judgment. In one judgment the expected effects of each option were known, and the subject rated the *advisability* of each option as a choice. This judgment is intended to be similar to judgments made in other studies in which subjects were asked about the goodness of decisions (Spranca *et al.*, 1991; Ritov & Baron, 1990). In the other judgment, the subject rated emotion, as in Experiment 1. In the emotion judgment, the two options were expected to be equally good, and one turned out to be better than the other by chance. (The emotion judgments were always made after the advisability judgments, lest the subject not believe that the outcomes were predictable for the latter.) This experiment therefore allowed us to ask whether emotion ratings are affected by different factors than those that affect advisability ratings.

Method

Sixty-five university student subjects, solicited by a sign on a walkway at the University of Pennsylvania, were paid $6 per hour to fill out a questionnaire individually or in small groups. Two were eliminated because of apparent serious misunderstanding attributable to poor command of English, leaving 63. A few other subjects inadvertently skipped a few questions each, but their remaining data were used. The questionnaire had four forms to counterbalance for order.

Advisability ratings. In the first half of the questionnaire, subjects were presented with two-option choices and were asked to "rate the *advisability* of each option, on a scale from −100 (bad decision) to 100 (good decision). Decisions with higher numbers should always be preferable to decisions with lower numbers. Feel free to go beyond −100 or 100 if you need to."

For the advisability ratings about pension funds, subjects were told, "In these cases, imagine yourself working for an employer in a job that you will be in for some time. You have a pension fund, which pays a certain rate of interest this year. For next year, your employer gives you the option of switching to a new fund by checking a box on a form. The only information you have about the two funds is the expected rate of interest for the next year." The cases were of the form,

1. Your pension fund now earns 7% interest. Your options are:
   A. Switch to the new fund, expected to earn 9%.
   B. Stay with the old fund, expected to earn 8%.

In the unemployment cases, subjects were told, "In these cases, imagine yourself as a U.S. government official charged with deciding whether to change a trade policy. If you recommend a change, your recommendation will almost certainly be accepted, because it will be part of a much larger bill and nobody will study it that carefully. The possible change affects mainly the projected unemployment rate of the workers in a particular industry for the next year." Cases were of the form:

1. The unemployment rate is now 7%. Your options are:
   A. Change the policy: 9% unemployment expected.
   B. Do not change the policy: 8% unemployment expected.

Table 2 shows the cases used for the four forms of the questionnaire. The percentages for Pension cases and Unemployment cases were identical; note, however, that a high percentage was negative for unemployment but positive for pensions. Forms C and D of the questionnaire were identical to forms A and B, respectively, except that the order of the Pension and Unemployment cases were switched. In Forms A and C, the act always came first (as in the example just given), and in forms B and D, the omission came first. Note that, for Forms A and D, cases 1, 2, 5, and 6 involved gains and cases 3, 4, 7 and 8 involved losses. However, in cases 5–8, one outcome was always identical to the status quo, so that we can look for a bias toward this outcome. In cases 9 and 10, the outcomes were 11 and 12%, as a check for sensitivity to outcome level.

Emotion ratings. In the second half of the questionnaire, subjects were presented with two outcomes and were asked to "rate how you think you would feel, on a scale from −100 (bad) to 100 (good) in each case."

TABLE 2
ITEMS USED IN EXPERIMENT 2

	Forms A and C			Forms B and D		
Case	Status quo	Omission	Act	Status quo	Omission	Act
1	7%	8%	9%	10%	9%	8%
2	7%	9%	8%	10%	8%	9%
3	10%	8%	9%	7%	9%	8%
4	10%	9%	8%	7%	8%	9%
5	8%	8%	9%	9%	9%	8%
6	8%	9%	8%	9%	8%	9%
7	9%	8%	9%	8%	9%	8%
8	9%	9%	8%	8%	8%	9%
9	9%	10%	11%	9%	11%	12%
10	9%	11%	10%	9%	12%	11%

Note. Act came before omission in Forms A and C, omission before act in B and D. Pension came first in A and B, Unemployment in C and D.

Subjects were again told that they could go beyond −100 or 100, and they were reminded to rate both outcomes.

The cases were in the same order as those in the first half. In the pension cases, subjects were told, "Imagine yourself working for an employer in a job that you think you will be in for some time. You have a pension fund, which pays a certain rate of interest this year. Last year, your employer gave you the option of switching to a new fund by checking a box on a form. Your employer thought that the two funds were equally good, and your co-workers had different opinions about whether to change or not." The first case of one form (corresponding to the case given above) was:

1. Last year, your pension fund earned 7% interest.
   It earned 8% this year, and the new fund earned 9%.
   A. You switched to the new fund, and you earned 9%.
   B. You stayed with the old fund, and you earned 8%.

In the unemployment cases, subjects were told, "Imagine yourself as a U.S. government official. Last year you were charged with deciding whether to change a trade policy. If you recommended a change, your recommendation was accepted. The effect of the change was mainly on the unemployment rate of the workers in a particular industry in the current year. At the time you made the decision, you were very uncertain about which policy was better." The first case of this form was:

1. Last year's unemployment rate was 7%.
   A. You changed the policy. This year's unemployment rate was 9%. If you had not changed, it would have been 8%.

B. You did not change the policy. This year's unemployment rate was 8%. If you had changed, it would have been 9%.

Results

Presentation order had no effect on any measures. The results are summarized in Table 3, which shows the mean ratings in each condition. Note that the alternative options in each choice are diagonally opposite in each group of four conditions. For example, in the Pension Advisability ratings when the status quo was 7%, one choice was between the act leading to the better outcome of 9% (GB, rated 69 on the average) and the omission leading to the worse outcome of 8% (GW, rated 7); the letter G indicates that both outcomes were gains compared to the status quo. The rightmost two columns represent 11 and 12% outcomes. These were included to check the response to large changes. It is apparent that subjects gave higher ratings to better outcomes in these cases. These data are

TABLE 3
MEANS OF RATINGS FOR ALL CONDITIONS IN EXPERIMENT 2

Advisability										
Pension										
Status-quo:	7%		10%		8%		9%		9%	
Outcome:	9%	8%	9%	8%	9%	8%	9%	8%	12%	11%
Condition:	GB	GW	LB	LW	gb	gw	lb	lw		
Act	69	−7	54	−52	54	−17	48	−38	69	33
Omission	79	7	59	−36	66	4	61	−20	76	43
Effect	10	14	5	16	12	21	13	18	7	10
Unemployment										
Status-quo:	10%		7%		9%		8%		9%	
Outcome:	8%	9%	8%	9%	8%	9%	8%	9%	11%	12%
Condition:	GB	GW	LB	LW	gb	gw	lb	lw		
Act	70	3	36	−46	61	−11	51	−40	3	−58
Omission	64	7	35	−48	56	−11	42	−33	0	−59
Effect	−6	4	−1	2	−5	0	−9	7	−3	−1
Emotion										
Pension										
Status-quo:	7%		10%		8%		9%		9%	
Outcome:	9%	8%	9%	8%	9%	8%	9%	8%	12%	11%
Condition:	GB	GW	LB	LW	gb	gw	lb	lw		
Act	70	15	34	−34	58	−13	48	−28	81	51
Omission	69	21	39	−23	53	5	48	−11	81	50
Effect	−1	6	5	11	−5	18	0	17	0	−1
Unemployment										
Status-quo:	10%		7%		9%		8%		9%	
Outcome:	8%	9%	8%	9%	8%	9%	8%	9%	11%	12%
Condition:	GB	GW	LB	LW	gb	gw	lb	lw		
Act	65	−12	39	−38	53	−20	43	−30	20	−37
Omission	61	−7	41	−38	44	−22	42	−29	21	−39
Effect	−4	5	2	0	−9	−2	−1	1	1	−2

Note. Main conditions are in the same order for each scenario. Standard deviations range from 37 to 77. In labels of conditions, G = gain, L = loss, B = better outcome, W = worse outcome. Uppercase letters indicate choices in which both options are gains or both are losses: lowercase letters indicate choices in which one option is a gain or loss and the other is equivalent to the status-quo. Conditions not analyzed (the two rightmost columns) are not labeled.

ignored in all subsequent analyses because they are not included in the counterbalancing scheme.

All hypotheses concerning omission effects were tested by comparing the ratings assigned to acts and omissions that led to the same outcome with the same status quo. If the omission received a higher rating, the comparison was considered positive; if the act received a higher rating, the comparison was negative; and if the ratings were the same, the comparison was neutral. When conditions were combined, the number of positive comparisons was compared to the number of negative comparisons. The results was considered positive if there were more positive than negative comparisons. Thus, each subject was counted as positive, negative, or neutral for each question asked, and two-tailed sign tests were used throughout. (Wilcoxon tests yielded substantively identical results). These conservative procedures were adopted because about half of the subjects gave the same rating to the act and the omission in each comparison (range, 36 to 64% across comparisons), contrary to the error assumptions required for parametric statistics.

One question was whether omissions were rated higher than acts across all conditions (Better vs Worse, Gain vs Loss). This general bias was found for Pension (49% positive vs 13% negative; $p = .000$) but not for Unemployment (45% vs 37%). Within Pension, it was found for both Advisability (43% vs 18%, $p = .015$) and Emotion (56% vs 13%, $p = .000$).

A second question was whether omission bias was greater for losses than for gains, as predicted by unequal weighting. To measure this effect, we counted a subject as positive if there were more positive Loss and negative Gain comparisons than negative Loss and positive Gain comparisons, with everything changed accordingly for counting a subject as negative. This effect was not found anywhere. Combining all conditions and scenarios, 47% of the subjects were positive, 42% negative. Recall that Experiment 1 also found no such effect.

A third question was whether the omission bias was greater for the worse of the two outcomes than for the better of the two, as predicted by norm theory and as found in Experiment 1. Subjects were classified according to whether positive Worse and negative Better comparisons outnumbered negative Worse and positive Better. This effect was found for Pension (61% vs 25%, $p = .004$) and Unemployment (60% vs 23%, $p = .003$). Within Pension, it was found for Emotion (56% vs 21%, $p = .004$) but not for Advisability (29% vs 24%). Within Unemployment, it was found for both Advisability (51% vs 22%, $p = .012$) and Emotion (47% vs 23%, $p = .045$). It was significant for Advisability with Pension and Unemployment combined (56% vs 22%, $p = .004$).

Recall that omission bias was found across all conditions for Pension

but not for Unemployment. That result combines with the result just found to produce the following effects: for Unemployment, omission bias was found for the worse outcome (53% vs 25%, $p = .020$), and a reverse bias was found for the better outcome (30% vs 55%, $p = .050$); for Pension, a bias was found for the worse outcome (67% vs 13%, $p = .000$) but not for the better outcome (43% vs 34%).

In sum, the interaction predicted by norm theory and found in Experiment 1 was replicated for both emotion and advisability judgments (except for Pension Advisability). Omission bias was stronger when it led to the worse outcome, regardless of the relation of the possible outcomes to the status quo.

A fourth question concerns the bias toward the status quo itself. In a sense, the omission in this study is associated with the status quo, since it is the current pension fund or government policy that stays in effect if nothing is done. But another feature of the status quo is the current interest rate or unemployment rate, and we can ask whether subjects tend to favor the option that maintains this rate the same, other things being equal. To assess this status quo effect, we subtracted the raw ratings of cases with 8% status quo and 9% outcome or with 9% status quo and 8% outcome from the ratings of cases with 8% status quo and 8% outcome or with 9% status quo and 9% outcome. This effect was significant for Advisability ratings (Pension Advisability effect = 8.4, $t(62) = 2.69$, $p = .009$; Unemployment Advisability effect = 6.7, $t(62) = 2.35$, $p = .022$; Advisability ratings combined, $t(62) = 3.45$, $p = .001$) but not for Emotion ratings (Pension Emotion effect = 4.4, $t(60) = 1.97$, $p = .054$; Unemployment Emotion effect = 1.0, $t(59) = 0.55$, $p = .586$, Emotion ratings combined $t(59) = 1.60$, $p = .115$). The difference between Advisability and Emotion in the size of the effect was almost significant ($t(59) = 1.93$, $p = .058$). The effect was significant over Advisability and Emotion ratings combined ($t(59) = 3.09$, $p = .003$). In sum, maintaining the most important feature of the outcomes, the percentage of interest or the unemployment rate, seems to be preferred, especially for Advisability ratings.

A fifth question is whether omission was used as the reference point, as predicted by loss aversion and norm theory. If so, then the mean rating for both options in a pair would be higher when the omission is associated with the worse option than when it is associated with the better option. Also, we would expect "zero" ratings to be more frequently given to omissions than to acts. Both of these results were found by Spranca *et al.* (1991, Experiment 4). The first result was found here too: for Advisability ($t(62) = 2.58$, $p = .012$); for Emotion ($t(59) = 2.81$, $p = .007$; for Pension ($t(59) = 2.82$, $p = .007$); and for Unemployment ($t(59) = 2.64$, $p = .011$). However, zero ratings did not differ for acts (5.9%) and omissions (5.2%,

Wilcoxon test $z = 1.45$). Zero ratings were rarely used except for options that maintained the exact percentage of the status quo, regardless of whether this was associated with an act or omission. (12.9% of these options received zero ratings, as opposed to 2.2% of the other options in the same decisions.) In sum, evidence for the use of the omission as the reference point is mixed.

In general, Experiment 2 found evidence for an overall omission bias (better and worse outcomes combined) in one scenario. In all scenarios, omission bias was stronger for the worse outcome than for the better outcome. We also obtained further evidence for a status quo effect that is independent of omission bias, and we found some evidence for the use of omission as a reference point.

EXPERIMENT 3

Experiment 2 asked subjects to give ratings, but other studies have asked for direct comparisons. Experiment 3 was a replication of Experiment 2 using direct comparisons instead of ratings.

Method

Eighty-nine subjects, solicited as in Experiment 2, were given a questionnaire introduced as follows, for pension funds:

> In each of these cases, imagine two people, P and Q, working for different employers in jobs that they will be in for some time. They each have different pension funds. Each fund pays a certain rate of interest this year. For next year, each employer gives each person a chance to switch to a new fund by checking a box on a form. The only information they have about their options is the expected interest rate for the next year.
>
> In each case, indicate which person, P or Q, made the better decision (or the less bad decision). If you think that their decisions were exactly equally good, write 'equal,' or an equal sign. The two decisions to compare always yield the same expected interest in the next year.

The first item for one version then read:

> P's current pension fund earns 7% interest. Next year, this fund is expected to earn 8%, and the new fund is expected to earn 9%. P switched to the new fund.
>
> Q's current pension fund earns 7% interest. Next year, this fund is expected to earn 9%, and the new fund is expected to earn 8%. Q did not switch to the new fund.

Parallel changes were made for the unemployment cases. For the emotion ratings, the subjects were asked to indicate which of two people felt better (or less bad) or whether the two felt the same. The outcomes were unanticipated, as in Experiment 2. The items used were based on numbers 1–8 in Table 2. Only Forms A and B were used. 17 subjects were omitted from analysis because they gave "equal" in every case, and one subject was omitted for giving extremely idiosyncratic responses, leaving 71.

Results

Data were analyzed as in Experiment 2. Of course, the comparison of act and omission was done directly by the subject rather than through comparison of numerical ratings.

The overall bias toward omissions (better and worse combined) was found for the decision comparisons but not for the emotion comparisons. The effect was significant for Pension decisions (49% vs 20%, $p = .006$), for Unemployment decisions (43% vs 20%, $p = .024$), but not for Pension emotions (30% vs 35%) or Unemployment emotions (34% vs 31%). These results contrast inexplicably with the results of Experiment 2, where an overall bias toward omissions was found for Pension items but not for Unemployment items.

The act–omission effect was greater for worse outcomes than for better outcomes in Pension decisions (56% vs 13%, $p = .000$), Pension emotions (69% vs 11%, $p = .000$), and Unemployment emotions (47% vs 16%, $p = .002$), but not in Unemployment decisions (37% vs 26%). Here, it is of interest that the overall bias toward omission was greater for decisions than for emotions, but the difference between better and worse outcomes in this effect was greater for emotions than for decisions: for 20 subjects this pattern was true, but for only 6 the reverse was true ($p = .011$). It would be difficult, then, to explain the overall bias toward omission in terms of just the fact that acts leading to the worse outcome are judged to be particularly bad. (For the worse outcome, omissions were not as bad as acts: $p = .000$ for Pension decisions; .059 for Unemployment decisions; .000 for Pension emotions; .017 for Unemployment emotions. For the better outcome, acts were better than omissions for Pension emotions [$p = .000$] and Unemployment emotions [$p = .018$], but the difference for the decision items was not significant.)

The act–omission effect was no greater for losses than for gains in emotions, in decisions, for Pension, or for Unemployment.

Although the results from Experiment 3 differ from those from Experiment 2 in the conditions for overall omission bias, both experiment show an omission bias for the worse of two outcomes, this replicating the major finding of previous studies. The results of both experiments also agree strongly in finding an effect of better vs worse on omission bias, as predicted by norm theory, and in finding no effect of gain vs loss, thus failing to support unequal weighting.

EXPERIMENT 4

The unequal weighting hypothesis has received no support from the experiments reported so far. Changing the status quo did not affect omission bias. The evidence that led to this hypothesis, however, came from

the Ritov and Baron (1990) study of hypothetical vaccination decisions. Experiment 4 returns to the scenario used in that study to test again the prediction that omission bias for losses will increase as the status quo becomes better.

Method

Forty-one subjects, solicited as in Experiments 2–3, were given a questionnaire in which they were told,

> "Imagine that you are married and have one child, who just became one year old. You live in a country in which one-year-olds sometimes die from a kind of flu. A vaccine for this kind of flu has just become available in your country. It has been tested extensively elsewhere. The vaccine completely prevents the flu, but it sometimes causes side effects that can be fatal. Aside from death, neither the flu nor the vaccine causes any long-lasting ill effects. The vaccine is free and is given along with other vaccines that you must have anyway, so no extra effort or expense is required.
>
> In each of the following situations, you are to indicate the *probability that you would vaccinate* your child, on the basis of three facts:
>
> 1. The *overall current death rate from the flu* in the last year. This number has been about the same for several years.
> 2. The predicted *overall death rate for unvaccinated children in the coming year.* You can assume that this prediction is accurate. It can differ from the current death rate because of a sudden and unexplained increase or decrease in the flu worldwide.
> 3. The predicted *overall death rate for vaccinated children in the coming year.* No one can predict which children will die from the flu and which children will die from the vaccine. A child who dies from the vaccine would not necessarily have died anyway from the flu, and vice versa."

In case 1, subjects were told: "10 out of 10,000 children currently die from the flu. 10 out of 10,000 unvaccinated children will die from the flu in the coming year." They were then asked to indicate the probability that they would vaccinate for four different death rates for vaccination, 1, 5, 9, and 13 out of 10,000. The status quo was changed from 10 out of 10,000, for about half of the subjects, to 5 for case 2 and 15 for case 3. For the other half it was 15 for case 2 and 5 for case 3. All other information, including the expected death rate without vaccination (the omission), was left unchanged. Case 4 was identical to case 1 except that subjects were told, "In the following case, imagine that the vaccine causes no deaths, but it is not fully effective. Vaccinated children could die from the flu, because the vaccine could fail." Ritov and Baron (1990) found increased willingness to vaccinate in this kind of case even in subjects who would accept little risk from the vaccine in a case like case 1.

Four additional cases were presented, in which subjects were asked to "rate the *quality* of the decisions in each case on a scale in which −100 indicates a very bad decision and 100 indicates a very good decision." In

case 1 of this group, subjects were told, "7 out of 10,000 children currently die from the flu. 7 out of 10,000 unvaccinated children will die from the flu in the coming year." They then rated the quality of vaccinating and not vaccinating for vaccination death rates of 1, 5, 9, and 13 out of 10,000. The next two cases had a status quo of 13 or 1 death, in balanced order. The last case again had a status quo of 7, and subjects were asked to assume that all deaths of vaccinated children were from vaccine failure.

Results

The basic omission bias was demonstrated in some of the measures. In the first case, 19.5% of the subjects gave less than 50% as their chance of vaccinating even when vaccination led to a risk of only 1 out of 10,000. When the risk was 5 (half the risk of the flu), 34.1% indicated that they probably would not vaccinate, and when the risk was 9, 51.2% so indicated. (75.6% indicated they would probably not vaccinate when the risk was 13, and 12.2% indicated that they probably would vaccinate, despite the increased risk of doing so.) The probability ratings for the first case were significantly lower than those in the last case, vaccine failure ($t(40) = 4.37$, $p = .000$). The same results were found for the quality ratings: ratings of vaccination were higher for the last case ($t(40) = 4.24$, $p = .000$), and ratings of nonvaccination were lower ($t(39) = 3.67$, $p = .001$). One measure that did not show an omission bias was the overall difference between the quality ratings of vaccination and nonvaccination ($t(39) = 1.04$). The finding of omission bias even when nonvaccination is equal to the status quo (as it was in case 1) is new; in Ritov and Baron (1990), the status quo was always assumed to be zero risk.

As hypothesized, omission bias was greater (probability ratings lower) when the status quo was better (lower death rate). The ratings of probability of vaccination were higher when the status quo death rate was higher (mean ratings of 52 vs 47, $t(40) = 3.30$, $p = .002$). Likewise, the quality ratings of vaccinating were higher (27 vs 14, $t(40) = 2.89$, $p = .006$) and the ratings of not vaccinating were lower (-6 vs 8, $t(40) = 3.40$, $p = .002$).

This result appears to support unequal weighting. An additional experiment, however, suggests that the result was an artifact. After an essentially identical introduction to that described above, 29 subjects were asked about the probability of their vaccinating in each of 9 cases. The status quo, nonvaccination outcome, and vaccination outcome were described for each case. (The status quo and nonvaccination outcomes were therefore repeated every time, even when they were held constant across several values of the vaccination outcome, unlike the version described above.) The status quo was 10 out of 10,000 for the first three cases and 5 and 15 for the next two groups of 3, in balanced order. The nonvacci-

nation outcome was always 10. The vaccination outcome was 0, 5, and 10 for the members of each group of three cases, respectively. At the end of the questionnaire, subjects were asked if they gave different answers to any of the cases that differed only in status quo (cases 4 and 7, 5 and 8, or 6 and 9), and, if so, they were asked to explain their ratings.

Out of the 29 subjects, 16 showed the effect of status quo, with higher probability ratings when the status quo was higher (worse); 2 showed the reverse effect; 8 gave identical ratings; and 1 gave mixed ratings (some higher, some lower). Out of the 16 subjects who showed the effect, six subjects gave justifications indicating that the status quo should be taken into account in predicting the results of nonvaccination, for example: "In [the high death-rate status quo case] it seemed as the flu struck more people. Therefore it would be more likely to take more precious children the next year. It seemed more serious." "In [low status quo], past numbers show that in the past, the flu hasn't been fatal. In [high status quo] the fact that 20/10,000 died of flu the year before makes me think the vaccine is still safer than risking the flu despite predictions." As additional 6 subjects referred to the status quo as justification but without spelling out their reasoning (as these other subjects did), e.g., "because 0 people died from the flu, so it probably wasn't that big." The remaining 4 subjects gave incomprehensible or irrelevant justifications, e.g., "The amount of children that die from the vaccination increases, the more probable my child will die."

In sum, the status quo seems to be relevant because subjects think it should be taken into account in predicting the results of nonvaccination. No subjects said anything that could be interpreted as supporting unequal weighting, e.g., that the result of vaccination was worse than the status-quo or that it was more important to consider the effect of acting. The results leave us skeptical about the existence of any true effect of the status quo on the magnitude or direction of omission bias, as predicted by unequal weighting.

EXPERIMENT 5

In Experiments 1–3, the omission could be seen as maintaining the status quo (e.g., the stock or fund owned). It is not clear, then, whether the results we have found concerning the interaction between act vs omission and better vs worse are specific to omission bias. They could also pertain to the status quo bias. In Experiment 4, the omission did not maintain the status quo, but we could not carry out a clear test of the interaction. (The omission outcome varied across cases, and the act outcome varied within cases.) In Experiment 5, we compared the status-quo and omission biases in different items. We examined the effect of gain vs

loss and of better vs worse on each bias. The cases were new, so they also bear on whether our results are robust across different kinds of items.

Method

Eighty-nine subjects, solicited as in Experiment 2–4, completed a 16-item questionnaire (42 in the order to be described, 47 with the items in reverse order).

Subjects were asked to "rate the *advisability* of each option, on a scale from −100 (bad decision) to 100 (good decision). Decisions with higher numbers should always be preferable to decisions with lower numbers. Feel free to go beyond −100 or 100 if you need to. In the following cases, imagine that you have high blood cholesterol and that you are taking medication to reduce it. Because of other changes in your medical condition, your cholesterol level will not remain the same from year to year, even if you keep taking the same medication. All possible medications are equivalent in side effects and cost, but they are chemically different."

The status quo condition was presented first. The subject had to make a decision; no default was offered. The first item read "With your current medication, your level is 50% above normal. You must choose whether to:
A. stay with that medication, in which case your level will be 40% above normal, or
B. switch to a new medication, in which case your level will be 30% above normal."

In the next case, the 30% and 40% were switched, so as to unconfound better vs worse from stay (i.e., the status quo) vs change. In the next pair of cases, the current level was 20% instead of 50%, so that these cases were losses rather than gains.

The next four cases repeated the first four except that they concerned omission bias rather than the status quo bias. For example, item 5 read, "With your current medication, your level is 50% above normal. You will continue to receive this medication automatically from the pharmacy unless you ask the doctor to change the prescription. Your options are:
A. do nothing, in which case your level will be 40% above normal, or
B. switch to a new medication, in which case your level will be 30% above normal."

Finally, the last 8 cases were a repeat of the first 8 except that the subject was told, "In the following cases, you are a physician. Your patient has high blood cholesterol and is taking medication to reduce it. . . ." (As noted, the 16 cases were reversed for 47 of the subjects.)

Results

Table 4 shows the mean ratings, collapsed over the two perspectives (patient vs physician) and over the two orders. Perspective and order did

not affect any of the comparisons reported. Results were analyzed as in Experiment 2.

The omission bias was present overall, that is, omissions were rated higher than acts (44% vs 22%, $p = .019$). The status quo bias was not present (30% vs 25%).

As found in Experiments 1–3, omission bias was greater for the worse option than for the better one (33% vs 13%, $p = .012$), but the bias was no different for losses than for gains (25% vs 25%). The status quo bias did not differ as a function of worse vs better (17% vs 21%) or losses vs gains (19% vs 20%). In sum, the main result that omission bias is greater for losses does not seem to depend on the confounding of omission and status-quo.

As in Experiment 2, to test whether the omission was the reference point, we compared the mean ratings for both options in cases in which the omission was the worse outcome with the ratings in cases in which it was the better outcome. Again, ratings were higher in the former cases ($t(88) = 3.22, p = .002$). We also did the same test for the status quo, and this effect was not significant ($t(88) = 1.30$); the effect for omissions was larger than that for the status quo ($t(88) = 2.11, p = .038$). We have further evidence, then, that the omission tends to be considered as a reference point, or as closer to the reference point, but the status quo does not.

On the other hand, the reference point would also be expected to be given a rating of zero, insofar as zero ratings were given at all. An analysis of zero ratings found (as in Experiment 2) little tendency to assign them to the omission (3.4% for omissions, 2.7% for acts, Wilcoxon $z = 1.18$). Instead, zero ratings tended to be assigned to the option closer to the status quo, in both status quo and omission conditions (4.4% for that option, 1.5% for the option farther from the status quo).

TABLE 4
MEANS OF ADVISABILITY RATINGS FOR ALL CONDITIONS IN EXPERIMENT 5

	Status-quo or omission			
	50%		20%	
	Outcome			
	30%	40%	30%	40%
Status-quo condition				
Stay	70	0	29	−51
Change	72	−7	25	−56
Omission condition				
Omit	68	1	27	−54
Act	72	−14	27	−61

Note. Standard deviations range from 42 to 68.

In sum, the results of Experiment 5 agreed with previous results indicating that acts that lead to the worse outcome are particularly bad. This effect is peculiar to acting and not to simply changing the status quo. Conflicting evidence was found for the use of the omission as the reference point, as predicted by norm theory and loss aversion.

GENERAL DISCUSSION

Our results consistently support the hypothesis that acts leading to the worse of two possible outcomes are considered particularly bad, whether these outcomes are predictable or not. Subjects do compare outcomes to other outcomes in the choice set, not just to the status quo. The comparison between these outcomes is more relevant to the evaluation of acts than to the evaluation of omissions. This result is consistent with norm theory as we interpret it.

Although subjects may also compare outcomes to the status quo, they do not do so differentially for acts or omissions. The devaluation of acts that lead to the worse outcome is just as great when both outcomes are gains than when both are losses relative to the status quo. The last experiment indicates that acts that lead to the worse outcome are considered bad because they are acts, not because they change the status quo.

Most experiments contained at least one scenario or condition in which acts were considered worse than omissions, averaging over better vs worse and gain vs loss. Experiment 3 found that this general devaluation of acts was distinct from the particular devaluation of acts leading to the worse outcome (leading to an interaction between act vs omission and better vs worse): the general act-devaluation effect was found only for decisions, but the interaction effect was found only for emotions. The general effect is not predicted by norm theory, but it is explained by loss aversion. Alternatively, subjects might simply favor omissions, giving them "extra points." The conditions for this general bias toward omissions are as yet unknown. Although this effect was not found consistently, the general bias toward omissions for the worse outcome was consistent across the present experiments as well as previous ones.

Both norm theory and loss aversion assume that the omission is taken as the reference point. Our results support this prediction inconsistently. On the other hand, overall ratings of both options in a choice are higher when the omission was assigned to the worse option than when it is assigned to the better option. (This does not hold for the assignment of the status quo to the better or worse option.) On the other hand, subjects are no more likely to assign zero ratings to omissions than to acts. (Spranca *et al.*, 1991, Experiment 4, did, however, find such an effect for zero ratings.) Both of these tests assume that subjects will tend to assign zero, or ratings closer to zero, to whatever they take to be the reference point.

This assumption itself could often be incorrect, so the weak results of these tests does not refute the theories in question.

The unequal-weighting hypotheses did not fare well. Changing the status quo had essentially no effect. Moreover, in Experiment 4, reversals were found even when the status quo was in between the outcomes of acts and omissions. Reversals, then, are more easily explained by loss aversion applied to separate dimensions (e.g., losses from disease vs losses from vaccination), as argued earlier. Consistent with this account is Ritov and Baron's (1990) finding, replicated in Experiment 4, that the bias toward nonvaccination was reduced when the children who would die from the vaccine were the same ones who would have died anyway from the flu. In this case, it might be more difficult for subjects to segregate the dimensions.

Most of our results can be accounted for by a heuristic rule: avoid acts that lead to harm (compared to the outcome of omissions) even when they are compensated by benefit (again, compared to the outcome of omissions). Such a heuristic also accounts for reversals, as well as for demonstrations of the status quo bias in which the status quo is the default. This heuristic also accounts for previous results in which harmful acts were compared to harmful omissions across cases. Such a "do no harm" heuristic does not account for all the results, however. In some situations, we find an overall bias toward omissions, regardless of whether they lead to the better or worse outcome. This effect is not fully accounted for by the devaluation of acts that lead to the worse outcome. We do not know why this effect occurs.

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