

Why Are People Reluctant to Exchange Lottery Tickets?

Maya Bar-Hillel
The Hebrew University

Efrat Neter
Haifa University

Students were given lottery tickets and then were asked to exchange their ticket for another one, plus a small monetary incentive. Less than 50% agreed. In contrast, when given pens, and the same exchange offer, over 90% agreed. Experimental control rules out that the reluctance to exchange lottery tickets results (a) from overestimation of the winning probability of one's own ticket; (b) from a concern that the ticket, once exchanged, might win in the hands of another; (c) from an overly low transaction cost; (d) from "paranoia" due to the bizarreness of the social situation we created; (e) from "bonding" to the ticket. Rather, the possibility for *ex post* regret that exists when exchanging lottery tickets, but not pens, underlies this reluctance. The notion of regret is broader than previously supposed.

In a well-known experiment, Langer (1975) sold \$1 lottery tickets to 53 office workers. Each ticket came in a matched pair. One part was kept by the purchaser, and the matched part was deposited in a box, from which the winning ticket was later drawn. The prize was the collected amount of \$53. Almost all the office workers approached bought the tickets. Half the workers were handed a ticket by the experimenter, and half were allowed to choose their ticket themselves. A few days later, shortly before the lottery, the workers were approached again and on some pretext were asked how much they would require to give up their ticket. The average amount of money requested was over \$8 if they had chosen their tickets and \$2 if they had not. In addition, 10 of the choosers and 5 of the non-choosers initially said they wouldn't sell at all.

Langer (1975) focused on the large difference between the choosers and the non-choosers, attributing it to an "illusion of control . . . defined as an expectancy of a personal success probability inappropriately higher than the objective probability would warrant" (p. 313). When one chooses tomatoes in the market, one can choose them to be better than those the vendor might randomly pick. Likewise, hypothesized Langer, participants react to choosing lottery tickets as if they can choose them to beat the odds. The higher asking price for chosen tickets reflects a higher subjective probability of winning with a chosen ticket than with a random ticket. Little was made of the fact that non-choosers required, on average, double the buying price. Indeed, though it is irrational to value chosen tickets over random tickets if one believes that the lottery is governed by chance alone, there is nothing irrational in asking more to part with a

good (e.g., a lottery ticket) than one had paid for it, especially if the good is not readily replaceable, as was the case in Langer's study. Nonetheless, it seems that both groups were exhibiting some reluctance—albeit not the same amount of reluctance—to give up their lottery tickets.

Knetsch and Sinden (1984) reported another example of reluctance to trade lottery tickets. They gave some of their participants lottery tickets and others a few dollars in cash. Participants were then allowed to trade their lottery tickets for the cash, or vice versa: to use their cash to purchase a lottery ticket. A minority of the participants bought a lottery ticket when given the cash, whereas most held onto their lottery ticket when given such a ticket, thus exhibiting a relative reluctance to trade it for cash. It is reluctance to part with lottery tickets that is the focus of the present study.

Experiment 1

Reluctance to trade has previously been studied under the label of the *endowment effect* (Kahneman, Knetsch, & Thaler, 1990; Thaler, 1980), the *status quo bias* (Ritov & Baron, 1992; Samuelson & Zeckhauser, 1988), and *loss aversion* (Kahneman & Tversky, 1984). In those studies, however, trade was between a good and money, rather than between identical tokens of the same good. So too, in previous studies involving lottery tickets, trades of these tickets have been offered for money. The purpose of our first experiment was to see whether participants are reluctant to trade their own lottery ticket even in exchange for a replacement ticket rather than for money. We also were interested in how they would explain such reluctance and, in particular, whether it would involve a belief that their own lottery ticket is probabilistically superior, as suggested by Langer (1975).

Method

Participants. Participants were freshmen at the Israeli Technion in Haifa. The experimenter entered an engineering class at the end of a lesson and asked the 66 students present to voluntarily stay on for a few minutes to participate in a brief experiment. Sixty-one obliged.

Procedure. Participants were given numbered pieces of paper, la-

Maya Bar-Hillel, Department of Psychology, The Hebrew University, Jerusalem, Israel; Efrat Neter, Haifa University, Haifa, Israel.

We wish to thank Danny Kahneman for many helpful and insightful comments. This study would not have been the same without his help and suggestions.

Correspondence concerning this article should be addressed to Maya Bar-Hillel, Center for the Study of Rationality, The Hebrew University, Jerusalem 91904, Israel. Electronic mail may be sent via the Internet to msmaya@pluto.mscc.huji.ac.il.

beled *lottery ticket number #*. On each ticket there was a place for participants to write their name, as well as their answers to three questions. Following Langer's (1975) procedure, we had another set of tickets in a bag, numbered in correspondence to the distributed set. After the participants wrote down their names, one of these tickets was drawn blindly by a volunteer student and handed over to the experimenter, who alone looked at the number on it and temporarily put it in the care of the volunteer student. The experimenter then asked three questions out loud. The first question was: "Would you be willing to exchange your ticket with someone else in this class? Anyone who exchanges their ticket will be given this sweet." (The sweet was a rather attractive and expensive truffle.) Participants wrote *willing* or *unwilling* in the first line. The second question was: "Are the chances for your ticket to win the lottery higher, lower, or equal to the chances of any other lottery ticket?" Participants wrote *higher*, *lower*, or *the same* on the second line. The final question was: "Why are you, or aren't you, willing to exchange your ticket?" Participants wrote a freestyle answer on the third line (there was room to write more than one line). After writing down their answers, participants who indicated a willingness to exchange their tickets handed them in, and the returned tickets were redistributed, along with the promised sweets. The winning number was then read out, and the holder of the corresponding number (irrespective of whose name was on the ticket) received the prize. The prize was a voucher worth 50 shekels (about \$17) for the Technion bookstore.

Results and Discussion

Table 1 shows the joint distribution of participants according to their answers to the first two questions. Although 36 participants were not willing to trade their ticket, only 5 of them attributed to their ticket a larger probability of winning than that of any other ticket—compared with 4 who thought the probability of their ticket's winning was actually smaller than any other ticket. To be sure, the normative answer to the question regarding the ticket's chances of winning was given relatively more frequently by participants who were willing to trade (88%) than by those reluctant to trade (75%), but the overall proportion of the normative answer to this question (80%) far outstripped the proportion willing to trade (41%). It seems that the reluctance to trade cannot be fully explained by an erroneous belief regarding one's winning chances.

To what did participants attribute their decision? Interestingly, sometimes the same reason was used by some participants to explain willingness to exchange and by others to explain reluctance to exchange. For example, the most commonly given reason ("All tickets are the same, so what difference does it make?") was given by 9 non-exchangers and 9 exchangers. Belief in fate was given by 3 people as reason for not changing ("I

must stick with what I got") and by 2 as reason for changing ("If I'm meant to win, I will"). Having a lucky number was given by 2 people as a reason for not changing ("7—lucky number!") and by 2 as a reason for changing ("I have lucky numbers, and the one I received is not one of them").

Experiment 2

The results of Experiment 1 extend previous findings. They show that people may require more than a replacement ticket and a small extra incentive to give up "their" lottery ticket, even though tickets in this experiment had not been chosen. In contrast to Langer's (1975) supposition, very few participants inflated their ticket's winning probability. Most of those reluctant to exchange their ticket acknowledged that the replacement ticket was not inferior to their own. In the circumstances of Experiment 1, this reluctance is irrational from the perspective of normative choice theory, because it amounts to the rejection of a dominant option (exchange one lottery ticket for an equivalent lottery ticket plus a small bonus).

What could bias one in favor of holding onto one's own ticket, if it isn't the notion that one's ticket has a higher probability of winning? One possibility is the anticipation of regret. Imagine if the ticket one gave up were to win in someone else's hands. Failing to win the lottery that way might feel so much worse than losing it with one's original ticket—even though both possibilities may be judged equiprobable—that one could "kick oneself" (Miller & Taylor, 1995). Indeed, some of the participants in Experiment 1 explained their reluctance to exchange by mentioning possible regret explicitly ("If I exchange and not win, I would be pissed. If I don't exchange and don't win, I'd know that I wouldn't necessarily have won had I exchanged").

Kahneman and Tversky (1982) described to participants two investors who had a choice between investing in Stock A or Stock B and ended up losing \$1,200. One investor incurred the loss as a consequence of owning A and switching, after deliberation, to B, and the other incurred the loss as a consequence of owning B and failing, after deliberation, to switch to A. Almost all participants believed that the first investor would experience more regret than the second one. When facing the decision whether or not to exchange their lottery ticket, our participants may ask themselves a similar question and respond similarly: "Chances are that I will not win this lottery. I could switch and not win, or I could not switch and not win. I think I would regret the first possibility more."

Losing a lottery with an exchanged ticket might be more painful than losing it with an original ticket, because of the possibility, attendant only on an exchange, of finding out that one's original ticket had won in another's hands. In a pertinent study, Ritov (1993) found that choice between pairs of binary gambles was affected by whether it was known to be followed by resolution of uncertainty for the rejected gamble (i.e., playing it out) in addition to the chosen one (e.g., participants in her complete-resolution condition chose a high-risk high-gain option significantly more often than participants in the other conditions). Would regret—and reluctance to exchange—still affect choice if this possibility were removed? In contrast, would its effect be intensified if knowledge of how one "blew it" were made public?

Table 1
Number of Participants Who Reported That Their Ticket Was More, Less, or as Likely to Win as any Other

Participant's report	Willing to exchange	Unwilling to exchange	Total
Think all tickets equiprobable	22 (45%)	27 (55%)	49
Think own ticket more likely	1	5	6
Think own ticket less likely	2	4	6
Total	25 (41%)	36 (59%)	61

In Experiment 2 we manipulated the regret opportunities through the extent of participants' uncertainty resolution. Participants were told either that they would, or that they would not, find out whether a ticket they had exchanged had then won. Moreover, they were told whether the other participants also would find out that the winning ticket had previously belonged to someone who had exchanged it. If the intensity of the anticipated regret is the driving force behind the reluctance to exchange, then we should find most exchanges where there is the least uncertainty resolution, and least where the uncertainty is publicly resolved.

Method

Participants. In Experiment 2, participants were undergraduate communications students at The Hebrew University. As before, they were approached at the end of a class and were asked to volunteer 10 min of their time for a brief experiment.

Procedure. The procedure was similar to that of Experiment 1, with the following differences. The bonus for trading in this experiment was 0.5 NS (note: although at official exchange rates this was about \$0.17, Israelis regard it more like \$0.50). Presumably, 0.5 NS is preferred to 0 NS by all participants, whereas chocolate might legitimately be regarded neutrally or even negatively by some. (Two participants in Experiment 1 explained their reluctance to trade tickets by reference to the sweet: "I am on a diet;" "I don't care for chocolate"). The prize to be won was set to be an integer multiple of 10 NS and such that the lottery's expected value (given the number of respondents in each class) would be approximately 2 NS. Participants answered a single question: whether they would exchange their lottery tickets. Most important, the design included three "regret" conditions, differing in the extent of the regret opportunities. Each condition was run in a separate class, under slightly different instructions.

In the no-regret condition, all participants wrote their names on their tickets, and those who were willing to exchange their tickets were instructed to cross out their name from the original ticket and add it onto the replacement ticket. The tickets were then collected into a transparent plastic bag, and the lottery was conducted by blindly drawing one of them. Participants were told that the winner would be publicly announced by the (most recent) name on the winning ticket, rather than by the number on it. This assured that (besides the experimenter) only the winner would know if the winning ticket were an exchanged one, but a previous owner would be unable to recognize the winning ticket as his or her original ticket.

In the private-regret condition, participants were told that the winner would be announced by the name of its most recent owner as well as by the number it bore. Thus, if that ticket had previously belonged to some other owner, that owner would be able to recognize it by its number

(which they had all been instructed to note). Because this was explained in advance, participants in this condition could anticipate uncertainty resolution, namely, they could anticipate that if "their" ticket were to win in someone else's hands, they would know about it.

Finally, in the public-regret condition, participants were told that the winning ticket would be publicly announced by its number, as well as by the names both of its most recent owner and the name of its previous owner, if there were one. In this condition, therefore, participants could expect that not only themselves, but also everyone else in the class, would find out that they had given up a winning ticket, if this should turn out to be the case.

Results and Discussion

The first row of Table 2 reports the results of Experiment 2. These results give only weak, if any, support to the intensity-of-anticipated-regret hypothesis: Although the most exchanges were noted in the no-regret group, as predicted, more exchanges were noted in the public than in the private-regret groups, counter to prediction.

Kahneman (1995, p. 392) asked readers to imagine a decisionmaker choosing between two gambles:

Both gambles will be played but the decision maker will know only the outcome of the gamble chosen. Will the effects of regret vanish completely? The answer to this question is not yet known, but I suspect that it will be negative. . . . An intriguing possibility is that the evaluation of options is not constrained by what the decision maker expects to know about counterfactual outcomes but about what the decision maker expects to be knowable. Thus, options may be avoided because their outcomes are likely to be regrettable even if they are not in fact likely to be regretted.

Our results can be interpreted in a manner that supports Kahneman's conjecture. A direct test of this conjecture, as well as a replication, seemed in order.

Experiment 3

In Experiment 3, we added a fourth condition to the three conditions of Experiment 2. In this fourth condition, lottery tickets that were given up did not participate in the lottery at all but rather were removed from the lottery altogether and were replaced by brand new tickets. In terms of uncertainty resolution, this condition, called *no participation*, goes even further than the no-regret condition of Experiment 2. It does not just guard one against finding out the fate of one's relinquished

Table 2
Percentage of Participants Willing to Exchange Tickets Under Different Conditions of Uncertainty Resolution

Experiment	Condition												Total	
	Public regret			Private regret			No regret			No participation				
	%	N	Prize	%	N	Prize	%	N	Prize	%	N	Prize	%	N
2	37	19	40 NS	27	26	60 NS	45	49	100 NS				38	94
3	74	43	80 NS	36	44	80 NS	42	33	60 NS	43	40	80 NS	49	160
Total	63	62		33	70		44	82		43	40		46	254

ticket but actually guarantees that one's exchanged ticket could not possibly win, because a ticket relinquished is a ticket removed. In Kahneman's language, the outcome of an exchanged lottery ticket in this condition is not only unknown but is also unknowable: There simply is nothing to know. An unplayed gamble has unknowable outcomes. If Kahneman's conjecture extends regret enough, the no-participation condition should yield higher exchange rates than all three previous conditions.

Participants in Experiment 3 were also administered a written questionnaire, which they completed after the ticket exchange had taken place but before the lottery results had been announced. The questionnaire consisted of seven questions (inspired by the results of Experiment 1), each stating a reason (a), its inverse (b), and its dismissal (c), as detailed in Table 3. Participants were requested to endorse one of the three possibilities for each of the seven questions. Then they were asked to guess the modal response given to these seven questions by their classmates. Thus, these seven questions were answered twice: once according to the participant's own views, and once according to the participant's assessment of his or her fellow participants.

Participants are unlikely to have an informed estimate of how their peers answer this particular kind of question, and normally we would assume that they would make use of what has been labeled the *false consensus effect* (Ross, Greene, & House, 1977)—namely, they would guess that the modal participants answer as they themselves do. In this case, however, participants whose sincere answer appears embarrassing or irrational to themselves (e.g., those reluctant to admit having a "lucky number") might feel more comfortable assigning this reason to others than to themselves.

Method

Participants. Participants were Hebrew University undergraduates in the School of Education. They were recruited in the same way as before.

Procedure. In Experiment 3 we modified the lottery procedure somewhat, to include the no-participation condition. Instead of giving out numbered tickets and having correspondingly numbered tickets in the lottery bag, participants were given double tickets, identically numbered on both sides. In the no-regret, private-regret, and public-regret conditions, exchanged tickets were collected and redistributed, as in the previous experiments. Participants then tore their double ticket (whether original or exchanged) in half and deposited one half in the transparent lottery bag. In the no-participation condition, however, exchanged tickets were given up in their entirety and were exchanged for brand new tickets (rather than someone else's exchanged ticket). Therefore, exchanged tickets were not deposited in the bag and were not included in the lottery. The bonus for exchanging was doubled in this experiment from 0.5 NS to 1 NS.

Results and Discussion

The pattern of responses in Experiment 3 differs somewhat from that of Experiment 2, as shown in the second row of Table 2. First, the overall rate of exchange was higher, perhaps because the incentive for exchange was higher. More pertinent, the ranking of tasks by the exchange rates was different. The public-regret condition, which we expected to yield the lowest rate of exchange, yielded the highest rate, and the no-participation

condition, which we expected to yield the highest rate of exchange, yielded a rate of exchange similar to that obtained in the other two conditions.

Taken together, the results seem to show no systematic relationship between participants' reluctance to exchange their tickets and the degree of uncertainty resolution participants were led to anticipate. We expected the willingness to exchange to increase across the four conditions going from left to right. No such trend was found. In particular, the no-participation condition does not seem to diminish the reluctance to exchange lottery tickets. Is there any systematic relationship between the degree of uncertainty resolution and the potential for feeling regret?

Question 7 of the questionnaire asked directly about regret. We had intended this question as a kind of manipulation check for our regret manipulation, expecting participants to endorse "I don't see any possibility of feeling regret" in the no-regret and no-participation groups. However, the responses to Question 7 also failed to support the notion of regret as increasing with the expected amount of uncertainty resolution. The percentages of people who endorsed "I don't see any possibility of feeling regret" in the public-regret, private-regret, no-regret, and no-participation groups were 40%, 48%, 27%, and 53%, respectively. The rates of endorsement for the last two groups actually were somewhat lower than the rate for the first two groups.

The notion of regret we evoked in Experiment 2 involves unease at the possibility of finding out that one had given up a winning ticket, if that were to happen. Indeed, this is the way regret is conceptualized in most experimental studies of its effects. This notion cannot account for the rates of exchange that we found, nor for the answers to the regret-related question in the questionnaire. Rather, our participants seemed to be telling us simply that if they were to exchange their ticket, and then fail to win (a very likely possibility, under the conditions of our lottery), they might regret the very act of having exchanged their ticket, irrespective of the extent of uncertainty resolution. Indeed, in Experiment 1, 5 of 36 participants explicitly used a regret argument to explain why they would not exchange. Not one of them referred to how they would feel if their ticket won in another's hands, although in that experiment, because they would have found out about it, this could have been a legitimate concern. Rather, the participants referred only to how they would feel if they exchanged their ticket and then lost. A couple of participants went on to explicitly articulate their felt asymmetry between losing the lottery with an exchanged ticket and losing it with one's original ticket (see the quote in the introduction to Experiment 2).

If these results are taken seriously, they show that the counterfactuals with which actual outcomes are compared extend not only beyond the traditional notion of the known alternative outcomes but also beyond what even Kahneman (1995) conjectured, namely, unknown but existent alternative outcomes. Our participants seemed willing to entertain the tenuous counterfactual: "If only I hadn't exchanged my ticket, *maybe* it would have won," and even that vague possibility affected their decision. The subsequent experiments (5, 6, and 7) show in what ways these results should, indeed, be taken seriously. First, though, we continue our discussion of the results of the present experiment.

Table 3
Distributions of Answers to the Questionnaire

Reason	Percentage endorsing each reason		Percentage of correct predictions
	For self	For others	
1a. An exchange might decrease my chances.	10	16	58
1b. An exchange could increase my chances.	3	12	
1c. An exchange cannot affect my chances.	87	72	
2a. I believe in fate.	53	52	53
2b. I do not believe in fate.	11	16	
2c. Fate seems to me besides the point.	36	32	
3a. I received my lucky number.	6	23	53
3b. I did not receive my lucky number.	11	16	
3c. I didn't consider the number in terms of luck.	83	60	
4a. I liked the number I received.	19	23	58
4b. I did not like the number I received.	8	14	
4c. I didn't consider the number as such.	73	63	
5a. I was attracted by the bonus.	28	54	72*
5b. I was not attracted by the bonus.	28	24	
5c. I didn't consider the bonus.	44	22	
6a. I liked the idea of an exchange.	29	43	75*
6b. I did not like the idea of an exchange.	22	15	
6c. I am indifferent as to the act of exchanging.	50	42	
7a. If my ticket were to win in another's hands, I would feel much regret.	46	69	56
7b. Even if my ticket were to win in another's hands, I wouldn't feel regret.	11	8	
7c. I don't see any possibility of feeling regret.	43	23	

* Denotes a significant contribution to prediction beyond the base rate.

Consider now the rates at which the possibilities presented in the questionnaire were endorsed, for oneself and for one's peers. Some of the options in some of the questions seem more normative or rational than others. In Questions 1-4, Possibility c is such an answer, as are 2b and 5b (see Table 3). In all but Question 2, participants seemed to have attributed rational responses to themselves at least somewhat more often than to their peers. For example, a large majority of the participants (87%, as in Experiment 1) acknowledged that all tickets are equiprobable but were less sure that this belief is shared by their peers (only 72%).

The last column of Table 3 shows the contribution of each of the seven variables to predicting whether or not there will be an exchange, as derived through logistic regression. Of the 158 participants in Experiment 3, 79 exchanged their tickets, and 81 did not. The base rate for exchange, therefore, was nearly 50%. By knowing the participants' answers to each of the questions, the percentage of correct predictions can be raised from about 50% to the percentage stated in Table 3. Only two variables made a significant contribution; they are marked by footnotes. These two express one's attitude toward the bonus and toward the very act of exchanging. On the other hand, as we already noted in Experiment 1, one's perception of the probability of one's ticket winning does not contribute to the prediction of whether one would or would not trade, nor, for that matter, does one's expected regret.

We now leave the regret issue to pursue other variables

that might affect the rates at which our participants were willing to exchange their lottery tickets.

Experiment 4

In Experiment 4 we attempted a different kind of incentive for exchanging tickets. Whereas in the previous experiments the bonus for exchanging one lottery ticket for another was a small cash (or candy) prize, in the present experiment participants were promised that if an exchanged ticket were to win the lottery, the prize would be higher than if an original, unexchanged ticket, were to win (we had a way of knowing from the ticket number whether it was an originally distributed or exchanged ticket). A prize enhanced by about 50% translates into an extra expected value of 1 NS per exchanging participant if all participants exchange their ticket (comparable to the 1 NS cash bonus), and more than that otherwise.

In Experiment 4 we also wished to test whether framing could enhance exchange rates. In the previous experiments, participants were asked to exchange their ticket and, in return for consenting to do so, were promised some bonus. In the present experiment we framed the final choice (between an original ticket and a new ticket plus bonus) somewhat differently. We told participants that we were going to give them an opportunity to play the lottery for a larger prize, and to realize this opportunity they would have to exchange their ticket. Thus, rather than making the exchange the focus and the bonus merely the incentive, we

made the opportunity for a bonus the focus, and the exchange the means for achieving it.

Method

Participants. Participants were students taking summer school courses in economics at Tel Aviv University. They were recruited in class, as before.

Procedure. Because in Experiments 2 and 3 the extent of uncertainty resolution did not seem to matter much, in the ensuing experiments we used only the no-participation condition, namely, all exchanged tickets were withdrawn from the lottery and were replaced by totally new tickets, as follows. Participants were given double tickets and were asked to write their names on them. They were then asked whether they would agree to exchange their ticket and were promised an enhanced prize if they would exchange.

The decision problem was framed for the participants in the two manners detailed above (between, not within, classes). They were asked to write down their decision and their reason for it. Then the exchange was made, and the lottery was performed with the half-tickets that had been deposited in the bag by participants. The prizes were 120 NS in the ordinary-exchange frame, and 100 NS in the opportunity frame, respectively, enhanced for exchangers to 180 NS and 150 NS, respectively.

Results and Discussion

The proportion of participants who exchanged their ticket for an enhanced prize was 56% in the ordinary-exchange frame ($n = 61$) and 54% in the opportunity frame ($n = 45$). It does not seem that the frame made a difference. As to the fact that the exchange rates in this experiment were higher than the rate (43%) in the no-participation condition of Experiment 3 (which is the comparable condition in terms of procedure), it is possible that the present bonus may have been more attractive than the previous one. Given the group rate of exchange (which, of course, was not known to participants when they made their private commitment to exchange or not), the expected value of the enhanced prize was approximately double the 1 NS cash bonus given in Experiment 3 (the expected value of the enhanced prize for the 50% of the participants who were eligible for it was 2 NS higher than the original prize). It also is possible that the form of this incentive is more motivating. Kahneman and Tversky (1979) demonstrated that people are typically risk-seeking regarding small probability gains, namely, they prefer a small probability for a large prize to the certainty of its smaller expected value—here, they might prefer a $1/n$ probability for an extra n NS (assuming all of them exchange) than 1 NS for sure.

Experiment 5

Although our results rule out the possibility that the reluctance to exchange lottery tickets results from an enhanced probability that one's ticket would win, it is still possible that the value of one's ticket is enhanced in some other sense. What might make your own ticket more subjectively valuable than other tickets? A possible factor may be that participants were instructed to write their names on the tickets they were given and, moreover, were sometimes required to cross out their names prior to exchanging their ticket. Perhaps it is the fact that

one's ticket bears one's name that enhances its subjective value. We tested this possibility in Experiment 5.

Method

Participants. Participants were students in various Hebrew University classes, recruited as in the other studies. The classes approached were from various departments. We chose them rather arbitrarily (according to availability at the times we were prepared to run the experiments) and assigned them to conditions arbitrarily (i.e., we typically didn't even know what the class was when we decided to enter it with a certain condition).

Procedure. Because the classes varied in size (see Table 4), the lottery prizes varied in size correspondingly—100 NS in a class of 46, and 250 NS in a class of 120, for an expected value slightly larger than 2 NS. The procedure was the same as in the no-participation condition of Experiment 3 (i.e., double tickets, the torn off halves of which are deposited in a transparent bag, and exchanged tickets withdrawn from the lottery altogether), except that names were not always written on the tickets. The bonus was 1 NS in some cases, and it was an enhanced prize in other cases. Table 4 summarizes the conditions.

Results and Discussion

In the law class, we manipulated the name writing variable within the class. The class consisted of 120 students, half of whom got lottery tickets with a place on which to write their names, and half without. Participants were unaware of this manipulation, because all were just instructed to "fill out all the information required on the tickets" (namely, to write their reasons for their decision whether to exchange).

Clearly, whether names were written on the tickets made no difference in this class. The rate of exchange was almost identical for the two subgroups and, moreover, the combined rate of 56% is almost identical to the rate of 55% reported for a similar condition in Experiment 4. Also, omitting the names did not make a difference in the economics class, for which the bonus was 1 NS per exchange. The exchange rate of 50% is somewhat higher than the 43% exchange rate reported for the similar condition—no participation—in Experiment 3. Given the relatively small sample size for this condition, and the rather large variability in exchange rates reported in the previous experiments, this similarity is rather striking.

In regard to the reasons participants gave for their decisions, there also was no difference between the participants who did, and those who did not, write their names on the tickets. No participants in any of the classes gave "because my name is on it" as the reason for not exchanging. Moreover, in the law class, of the 14 participants who gave as a reason for their willingness to exchange a statement such as "I have no sentiments toward my original ticket," exactly 7 were in the "with names" group and 7 in the "without names" group.

It can safely be said, therefore, that the reluctance to exchange lottery tickets is independent of whether one's ticket bears one's name.

Experiment 6

Although the grand proportion of our respondents who were willing to exchange their lottery tickets was around 45%, the

Table 4
*Percentage of Participants Who Were Willing to Exchange Tickets
 With and Without Names on Them*

Type of tickets	Class	N	Prize	Bonus	% Exchanges
With no names on them	Economics	46	100 NS	1 NS	50
With names on them	Law	60	250 NS	50 NS	55
With no names on them		60			57
Total		166			54

proportion in the various classes we had entered up to this point ranged from a low of 27% to a high of 74% (in half the classes it was between 37% and 48%). The variance between classes did not seem to be related in a systematic fashion to any of the studied variables (e.g., probability enhancement, Experiment 1; the extent of uncertainty resolution, Experiments 2 and 3; the framing, Experiment 4; whether one's name was on the ticket, Experiment 5), except, perhaps, to the size or type of the bonus. Enhanced prizes were associated with higher exchange rates than were small cash bonuses, irrespective of the rate of enhancement, and larger cash bonuses were associated with larger exchange rates.

How much of the reluctance to exchange might be due to social psychological factors rather than to cognitive ones? In other words, perhaps the reluctance to exchange was not specific to the fact that the object to be exchanged was a lottery ticket, but rather to the somewhat bizarre nature of the task. Perhaps our participants could not quite understand the point of first being handed out tickets and then being offered a bonus to exchange those tickets for other tickets. Perhaps the situation was just odd enough to create a mild sense of paranoia ("Why would the experimenter want to tempt me into giving up my ticket?") or to engender the kind of mild confusion that makes one unsure as to the "proper" choice to make.

If we were running experiments in social psychology, rather than cognitive psychology, this could explain the absence of systematic variability as a function of the variables studied. The large variability found between classes could possibly be related to some subtle atmosphere created in the classes, with people somehow taking their cues from their classmates (in spite of our attempts to minimize social influence by having participants commit their decision to exchange or not in writing quietly and privately, before the exchange was actually made in public).

Finally, perhaps 1 NS is simply not quite enough to outweigh transaction costs for all participants. In other words, perhaps it is too trivial a sum to justify taking action to exchange one lottery ticket for another just like it (as some of our participants suggested in their written reasons for not exchanging).

If any of the above reasons were indeed the explanation for our results, then the reluctance to exchange should generalize to other objects offered to participants within the same paradigm. On the other hand, if other objects are exchanged with no reluctance, it would focus the phenomenon specifically to lottery tickets. In Experiment 6 we put this question to the test by endowing participants with pens rather than with lottery tickets while in all other respects completely replicating the procedure developed with lottery tickets.

Method

Participants. Participants were students in various Hebrew University classes (see Table 5 for details), recruited as in the other studies.

Procedure. As usual, we entered a class at its end and asked the students to stay on voluntarily for a few minutes, in return for which they were promised "a small gift." Volunteers were then handed out pens. The pens given out were, in some classes, attractive Pilot pens (the kind with which the late Prime Minister Yitzhak Rabin signed the peace treaty with Yasser Arafat), which retail for 3.5 NS in the university bookstore, and in other classes they were Zebra pens, which retail for 1.8 NS. Participants were then asked if they would be willing to exchange the pen they had just received for an identical pen plus a 1 NS cash bonus. They replied to this question privately and in writing, on a piece of paper on which they were requested, in addition, to give their reasons for their choice. Then those who were willing to exchange their pens did so and received the cash bonus, their written answers were collected, and the experiment ended.

Note that in every detail that is not directly linked to the lottery, this paradigm is identical to the one we used in the previous experiments. Insofar as there are subtle social cues imparted by the experimenter, even the experimenter was the same one in this experiment as in (most of the classes of) the previous experiments.

Some classes received pens with small, easily removable, stickers on them and were requested to write their names on the stickers. This was done prior to posing the option of exchanging the pens. Other classes received the pens without the stickers and did not put their names on the pens.

Results and Discussion

The rate of trading for pens was over 90%. The value of the pen made no difference (trading was 90% for the expensive pens, and 91% for the cheaper pens), nor did the act of writing one's name on the pen (92% with no name, 91% with name). There was hardly any variability across classes.

These results are very reassuring. Most important, they provide a control for all of the possible explanations put forth in the introduction to Experiment 6. First, they show that 1 NS is incentive enough to exchange. Indeed, exchanges in the present conditions were more "expensive" than in the previous experiments. Participants were told that if they did not want to exchange, they could hand in their piece of paper (the one on which they had written their decision and the reason for it) and could leave at once. In the lottery case, on the other hand, the non-exchangers had to wait until all exchanges had been made, because only then was the lottery carried out and the experiment ended. One could save some time by not exchanging one's pen, but not by not exchanging one's lottery ticket.

Second, these results rule out explanations such as paranoia,

Table 5
*Percentage of Participants Who Were Willing to Exchange Pens
 With and Without Names on Them*

Type of pens	Class	N	Pen type	% Exchanges	
With no names on them	Communications	16	Pilot	100	16
With no names on them	Geology	20	Pilot	85	17
With names on them	Geology	23	Pilot	87	20
With names on them	Statistics	31	Zebra	100	31
With names on them	Geography	39	Zebra	85	33
With names on them	Law	44	Zebra	91	40
Total		173		91	157

confusion, bizarreness, and so on. Some participants were indeed suspicious of the experimenter's motives—some expressed suspicion in their written reasons, the occasional one called out in class as the experiment was being run: "What's the catch?" Some participants did indeed think this was a bizarre situation—again, some expressed this in their reasons, the occasional one called out in class as the experiment was being conducted "Is this 'Candid Camera'?" Some participants did indeed try to take their cues from others—there was a buzz of excitement in all classes, here as well as in the previous experiments, as instructions were being read out, though we tried to enforce silence. All this was no hindrance to exchanging the pens, however.

Apparently, the dominance of exchanging over not exchanging was so compelling in this experiment that it overrode all the other considerations (one participant in the law class actually wrote: "I feel silly waiting around to exchange one pen for another for just a shekel, but it seems to be the 'correct' thing to do"). An analysis of participants' stated reasons for their decision shows that almost half of the exchanging participants (45%) explicitly articulated the dominance argument (e.g., "pen-plus-shekel is more than pen"), an additional 27% gave a semidominance argument (e.g., "I did it for the shekel"), and 14% simply said "Why not?" In the lottery exchanges, 90% of the exchangers gave a more or less complete dominance argument, but the exchangers accounted for only about half the participants. As many as 47% of the non-exchangers gave reasons such as "It was my fate to get this ticket," or "I like the number on this ticket"—reasons hardly ever encountered when the exchanged good was a pen.

Table 6
*Percentage of Participants Who Were Willing to Exchange Tickets
 for Those of a Same or Different Number*

Type of ticket exchanged for	Class	N	Prize	% Exchanges	
Different color, different number	Statistics	20	40 NS	40	8
Different color, different number	Economics	12	25 NS	75	9
Total		32		53	17
Different color, same number	Communications	12	25 NS	100	12
Different color, same number	Economics	17	40 NS	94	16
Total		29		97	28

Experiment 7

In this series of experiments, *reluctance to exchange* was defined as a relative unwillingness to exchange a token of some type for an identical token plus a small bonus. When the token is a lottery ticket, people are reluctant to exchange, even when they acknowledge that all lottery tickets have identical distributions. People exhibit no such reluctance with respect to pens. What objects are people reluctant to exchange, and what objects are not subject to such reluctance? It is tempting to infer that the generalization of a lottery ticket is any gamble (i.e., a gamble being something that represents a probability distribution over value, rather than a good or value in itself), and the generalization of a pen is a good with respect to which there is (practically speaking) no uncertainty.

A thought experiment suffices to show that this is not the proper generalization. Imagine a lottery in which the winner is determined by a random device (such as tossing dice), and participants who exchange a lottery ticket are nonetheless allowed to retain their original number. In other words, they exchange one physical object (the ticket) for another, but can put their old number on the new ticket, so that the new ticket wins the lottery if and only if the old ticket would have won it, and vice versa. Would there be reluctance to exchange? We tested this in Experiment 7.

Method and Results

Participants were Hebrew University students, recruited in class, as before. They were given lottery tickets that bore two single-digit numbers between 1 and 6. It was explained to them that the winning number

would be determined by throwing a die twice, once for each digit. The die would be thrown by a volunteer student from the class. In case the winning number were not held by anyone in the class (which could happen if there are fewer than 36 students in a class), the toss would be repeated until a winner were found in the class. The originally distributed tickets were white, and participants could exchange them for blue tickets, plus a 1 NS bonus.

In one condition, the participants who exchanged their white ticket for a blue one received a blue ticket that bore a number different than the number they originally had. This the participants were told in advance. As usual, they were asked whether they would be willing to exchange a white ticket for a blue ticket with a different number, plus a 1 NS bonus, and they wrote down their reasoned answer on the ticket. Tickets were then exchanged for participants who indicated a willingness to do so, and those participants received 1 NS. Then a volunteer threw the die to determine the winner.

Except for the change in the procedure for determining the winner (tossing a die rather than drawing a number from a bag), this situation is similar to the one studied throughout this article, and we expected, therefore, similar exchange rates, namely, reluctance to trade.

In the second condition, the blue tickets were unnumbered. Participants were told that if they exchanged their white ticket for a blue one, they should write their old number on the new ticket. Otherwise, the procedure was identical to that in the first condition. In this condition, it should be clear that whatever a participant's fate with a white ticket, he or she would have the same fate with a blue one. Insofar as this is clear, we expected participants in this condition to exchange their tickets with no less willingness than that exhibited by previous participants with respect to pens.

The results clearly bear out our expectations; see Table 6. We settled for only two classes and a small number of participants in each condition, because the different-number condition served only as a control and is highly similar to our previous conditions, and the same-number condition was so obvious that it could almost have been left as just a thought experiment.

An analysis of the reasons yields no difference when lottery tickets are exchanged for a different number or for the same number, beyond the difference in the proportion of exchanges itself.

General Discussion

Choice between two options, one of which dominates the other, is trivial. A case in point is if one option is A, and the other is A + B, where B is a desirable bonus. Many of our subjects regarded the choice between holding on to the pen they had just received, and exchanging it for a small cash bonus plus another, identical, pen, as just such a choice. Hence they found it easy—indeed, compelling—to choose to exchange. Not so with respect to the lottery tickets they were given.

Prima facie, it would seem that two tickets in the same lottery (i.e., two identically distributed gambles—as our subjects realized the lottery tickets to be) are as identical as two pens. There is nothing to distinguish the one from the other—presently, that is. However, (with the sole exception of the “same number” condition of Experiment 7) it is easy to imagine a state of the world in which an original ticket might win and a new one would not, or vice versa. As gambles, ex ante, the lottery tickets are identical. However, ex post, namely if the gambles were to be realized, they would not necessarily have the same value. The anticipation of this possibility is what underlies the reluctance to exchange lottery tickets.

The reluctance to exchange one lottery ticket for another requires, however, not only that the two lottery tickets be regarded as distinct rather than identical but also that they be regarded as not even symmetrical or equivalent, either. After all, the probability that one ticket would lose the lottery while the other wins it is the same as the probability of the reverse. If one were equally concerned about these two eventualities, one should still have been willing to exchange tickets for the promised bonus. Why be more concerned about one eventuality than about the other?

It is not the endowment in and of itself that induces the preference for one's held option, as shown by the absence of any such induced preference when the options were pens. Rather, it is the fact that from the vantage point of a ticket owner, the state of the world in which one's original ticket wins (or would have won, or could have won) but the new one does not, represents a “loss,” whereas the state of the world in which the new ticket, had one exchanged for it, would have won, but holding onto one's original ticket results in no win, is merely a foregone gain. Losses are with respect to what is—the actual; foregone gains are with respect to what might have been—the counterfactual. Once a ticket has been given out, it, and not any other, defines what is. It is here that the symmetry between the tickets breaks down: The normative economic approach notwithstanding, losses loom larger than same size (foregone) gains (Kahneman & Tversky, 1979, 1984; Thaler, 1980, 1985).

We did not actually study whether all tickets were regarded symmetrically before being handed out, but we have some pertinent anecdotal evidence. When tickets were being handed out in the various classes we entered, occasional students were out of the experimenter's convenient reach. In such cases, the experimenter often handed one student a bunch of tickets and asked him or her to pass the rest on down the row of students. Students did this with a nonchalance that suggests that they couldn't have cared less which ticket wound up in whose hands.

The asymmetry between losses and (foregone or actual) gains—called *loss aversion*—explains a wealth of experimental results collected in paradigms bearing some similarity to our own in that they also presented participants with a choice of whether to trade some good with which they had been endowed (hence called the *endowment effect*). Earlier in this article, we reported the reluctance to trade lottery tickets that Knetsch and Sinden (1984) found: The proportion of participants given lottery tickets who were unwilling to part with them (actually, “sell” them) for a stated cash amount was far higher than the proportion of participants who chose the lottery ticket (when offered a choice between it and that same cash amount). The same result was later obtained with respect to consumer goods, rather than lottery tickets. Kahneman et al. (1990) reported a study in which participants in three classes were given either coffee mugs, large Toblerone chocolate bars, or a choice between these two goods, respectively. The participants who were given the mugs were then allowed to exchange their mug for a chocolate bar, and the participants who were given the chocolate were allowed to exchange it for a mug. Among the choosers, 56% took the mug. Among those endowed with the mug, however, 89% chose to hold on to it, and only 10% of those endowed with the chocolate chose to exchange it for a mug.

The endowment effect follows from loss aversion: Once an

item—be it a lottery ticket, a mug, or a chocolate bar—becomes part of one's endowment, giving it up is experienced as a loss. Before an item becomes part of one's endowment, passing it up is experienced at most as a foregone gain. A loss hurts more than a foregone gain. Therefore there is greater reluctance to give up an item that is already one's own than to pass it up prior to its becoming one's own.

There are two novelties in our paradigm as compared with previous studies. First, the good that one was asked to give up was replaced by another token of the same type of good, so that even after an exchange one still possessed a token of that good—not of a different kind of good, or cash. Second, we gave participants an incentive to trade—one that was demonstrably larger than the transaction cost of the trade itself (as apparent from the near-universal exchange rates in the pen conditions). Where the exchanged goods were not perceived as identical (e.g., when they were lottery tickets that could potentially be subject to different "fates"), however, the incentive, for about half the participants, was insufficient to overcome the loss aversion, resulting in a reluctance to exchange that is not unlike the reluctance to trade reported in previous studies.

The two most interesting questions posed by our results are: (a) what is the difference between pens and lottery tickets that induces reluctance to exchange the latter and not the former? and (b) insofar as this is the effect of regret considerations, which operate on lottery tickets but not on pens, what is the nature of this regret? Our answer to the first question is that two identical pens are perceived as identical in all imaginable worlds, whereas two lottery tickets, even if they are identical as gambles, have the potential to have different worth once the gambles are played and the uncertainty resolved. Our answer to the second question is that the mere fact that two lottery tickets have the potential to result in different outcomes, and in particular, one can result in a desired outcome while the other results in a less desired outcome, suffices to induce an anticipation of regret (which is larger for an exchange than for its refusal). It is not necessary that this potential for having ex post different values actually be realized, far less known. It is enough that it exists.

This account might explain why other seemingly identical things are typically exchanged only with some reluctance: one combat mission for another, a seat on a flight for a seat on another flight, and so on. It also allows for testable predictions, and we are at present engaged in studying them. We invite the readers to compare their intuitions with our own.

Suppose participants are endowed with either a white or a blue token (rather than a lottery ticket or a pen). At the end of the experiment, these tokens will be redeemable for cash. In the first condition, the cash value of all the tokens, irrespective of color, is fixed in advance. Participants should show no reluctance to exchange a token of one color for a token of another, even though the tokens are not identical—most notably, they differ in color. In a second condition, all tokens will have an identical cash value, but what it is is not known in advance. Rather, it will be (or has been) determined by some chance process. Here, too, participants should be readily willing to exchange one token for another for a small cash bonus, even though each token now represents a gamble. Thus, being a gamble (as our lottery tickets were) is not sufficient to induce reluctance

to exchange (Condition 2), and being "identical" (albeit, in some naive sense of "identity," as our pens were) is not necessary to overcome this reluctance (Condition 1).

Of more interest are the following conditions. In the third condition, blue tokens will be redeemable for an as-yet-unknown cash amount, as will the white tokens, but it is known in advance that they will not be redeemable for the same amount. One token will be redeemable for the larger amount; whichever one it is will be (or has been) determined by some chance process. The conventional notion of regret is applicable here, leading to an expectation of reluctance to exchange. In the fourth and final condition, blue and white tokens will be redeemable for as-yet-unknown cash amounts, but what that amount is will actually be determined only for the color ultimately held by the participant. Our account makes the novel prediction that here, too, we would find a reluctance to exchange, although the conventional notion of regret is not applicable.

It is important to note that we do not take the position that it is the act of trading or exchanging that people find repugnant. In the typical voluntary trading situation, both parties regard themselves as better off after the trade than before it—or the trade would presumably not have taken place. Not only are the merchant and her client happy to trade goods for cash, but also the stamp collectors are happy to trade a stamp of which they already have one token for a novel stamp, or a stamp that completes a series for one that is a loner. Indeed, two soldiers may be happy to swap duties with each other if each prefers the other's day off to his or her own. In all these cases, however, the preference for one thing over another (be it a good vs. cash, one stamp vs. another, or one day off vs. another) presumably exists independently of which one of the two, if any, is part of one's present endowment. The phenomenon discussed in this article concerns how endowment with an option induces preference between two otherwise symmetrical or indifferent options.

References

- Kahneman, D. (1995). Varieties of counterfactual thinking. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 375–396). Hillsdale, NJ: Erlbaum.
- Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1990). Experimental tests of the endowment effect and the Coase Theorem. *Journal of Political Economy*, 98, 1325–1348.
- Kahneman, D., & Tversky, A. (1979). Prospect theory: An analysis of choice under uncertainty. *Econometrica*, 47, 263–291.
- Kahneman, D., & Tversky, A. (1982). The simulation heuristic. In D. Kahneman, P. Slovic, & A. Tversky (Eds.), *Judgment under uncertainty: Heuristics and biases*. Cambridge, England: Cambridge University Press.
- Kahneman, D., & Tversky, A. (1984). Choices, values and frames. *American Psychologist*, 39, 341–350.
- Knetsch, J. L., & Sinden, J. A. (1984). Willingness to pay and compensation demanded: Experimental evidence of an unexpected disparity in measures of value. *Quarterly Journal of Economics*, 99, 507–521.
- Langer, E. J. (1975). The illusion of control. *Journal of Personality and Social Psychology*, 32, 311–328.
- Miller, D. T., & Taylor, B. R. (1995). Counterfactual thought, regret, and superstition: How to avoid kicking yourself. In N. J. Roese & J. M. Olson (Eds.), *What might have been: The social psychology of counterfactual thinking* (pp. 305–331). Hillsdale, NJ: Erlbaum.

- Ritov, I. (1993, August). Probability of regret: Anticipation of uncertainty resolution in choice. Paper delivered at the 14th Subjective Probability, Utility and Decision Making conference, Fribourg, Switzerland.
- Ritov, I., & Baron, J. (1992). Status quo and omission biases. *Journal of Risk and Uncertainty*, 5, 49-61.
- Ross, I., Greene, D., & House, P. (1977). The "false consensus effect": An egocentric bias in social perception and attribution process. *Journal of Experimental Social Psychology*, 13, 279-301.
- Samuelson, W., & Zeckhauser, R. (1988). Status quo bias in decision making. *Journal of Risk and Uncertainty*, 1, 7-59.
- Thaler, R. H. (1980). Toward a positive theory of consumer choice. *Journal of Economic Behavior and Organization*, 1, 39-60.
- Thaler, R. H. (1985). Mental accounting and consumer choice. *Marketing Science*, 4(3), 199-214.

Received March 27, 1995

Revision received May 21, 1995

Accepted May 21, 1995 ■