

# To trade or not to trade: The moderating role of vividness when exchanging gambles

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## Abstract

Individuals are generally reluctant to trade goods—a phenomenon identified as the endowment effect. This paper focuses on consumers' puzzling reluctance to exchange gambles, and in particular lottery tickets with identical distribution (i.e., same odds of winning), and identifies the ticket's vividness as an important moderator. Three studies demonstrate that individuals are more willing to exchange less vivid lottery tickets (e.g., tickets concealed in envelopes, or tickets with an unknown number) compared to more vivid tickets (e.g., tickets not concealed in envelopes, or tickets with a known number) when offered an incentive to exchange. Moreover, this effect is mediated by anticipated regret, such that less regret is anticipated when exchanging less vivid tickets, thus increasing individuals' willingness to exchange tickets.

Keywords: endowment effect, exchange, gambles, loss aversion, regret, vividness.

## 1 Introduction

Throughout our lives we gamble. Some gambles are explicit, like horse races or lottery tickets. Others, like purchasing a house, getting on a plane, or getting married are more implicit. Once we have either chosen or received a gamble, we await the outcome. Would we willingly exchange one gamble for another, or would we rather stick to what we got simply because it is ours, or for fear of “tempting fate”? Imagine, for example, that you have received a lottery ticket in a sealed envelope. You are then offered a \$1 bonus to exchange your ticket for another ticket, with an identical distribution. What would you do? The rational thing is to exchange the tickets, since a ticket-plus-\$1 is more valuable than a ticket. But, would you? Would your decision to exchange be different if the ticket was not in a sealed envelope?

The endowment effect literature (e.g., Kahneman, Knetsch & Thaler, 1990; Thaler, 1980) would predict that people would not be willing to exchange due to the loss experienced from giving up a pre-owned object (e.g., Kahneman & Tversky, 1979). However, trade between identical goods should not evoke such a loss, and indeed, most people would exchange, for example, one pen for an identical pen (Bar-Hillel & Neter, 1996) or one candy for an identical one (Chapman, 1998) when offered a small

incentive to do so. In contrast, people are generally reluctant to exchange lottery tickets with identical distribution, i.e., tickets with an equal chance of winning, even when offered an incentive to do so (Bar-Hillel & Neter, 1996). According to Bar-Hillel and Neter (1996) it is the anticipation of ex-post regret from exchanging the ticket and losing the lottery that prevents people from exchanging.

Understanding willingness to exchange gambles is important, since many of our everyday choices can be represented as such—purchasing insurance, purchasing new, innovative products, going to an unfamiliar restaurant, or choosing a seat on a plane. For example, by going to an unfamiliar restaurant, or by ordering an exotic, non-traditional entrée, one is gambling the quality of the food and the nature of experience in that restaurant. Once people have chosen a gamble, let it be a restaurant, an entrée, or insurance plan, would they be reluctant to trade them, as they would be when offered to trade other goods?

This paper investigates a potential moderator to the reluctance to exchange such gambles, namely, their vividness. Specifically, I propose that more vivid gambles evoke more thoughts about the consequences of playing out that gamble, which in turn induce greater anticipated regret when offered to exchange. That is, when it is easy to imagine the consequences of the gamble (e.g., winning a lottery), one is likely to anticipate greater regret from exchanging that gamble and possibly changing the consequences of the gamble (e.g., losing the lottery as a result of the exchange). As a result, this greater anticipated regret reduces the likelihood of exchanging gambles. For example, when deciding among unfamiliar restaurants, being close to the restaurant (as opposed

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to deciding when still at home), increases the vividness of the restaurants, making regret more salient, which in turn reduces likelihood of switching from one gamble, i.e., restaurant, to another, even when offered an incentive to switch (e.g., a promotional offer).

This paper focuses on a specific type of gambles, namely lottery tickets. It is proposed that less vivid tickets evoke fewer thoughts about the tickets potentially winning the lottery and make it harder imagining the ticket winning. As a result, these less vivid tickets evoke less anticipated regret from exchanging and thus possibly losing the lottery. This reduced anticipated, ex-post, regret, leads in turn to increased willingness to exchange the less vivid tickets.

The next section reviews the literature on the endowment effect, regret, and vividness. Then, I present three studies that test the effect of ticket's vividness on amount and nature of winning-related thoughts (study 1) and on willingness to exchange the tickets (studies 2 and 3), using two types of lotteries and two manipulations of vividness. Study 3 additionally tests the mediating role of anticipated regret when analyzing the effect of tickets' vividness on willingness to exchange them. The paper concludes with a discussion of the implications of this research.

### 1.1 The endowment effect and ex-post regret

The endowment effect—the finding that people are reluctant to trade goods due to the “ownership” premium people place on goods they possess—has been widely studied (e.g., Kahneman et al., 1990; Thaler, 1980; Van Boven, Dunning & Loewenstein, 2000; Gal, 2006). The endowment effect can be explained in terms of loss aversion: the expected pain (or disutility) of giving up some object, or money, is weighted more (looms larger) than the expected pleasure or utility of receiving that good or money (Kahneman & Tversky, 1979; Tversky & Kahneman, 1991). If, however, a trade is between similar or identical goods (rather than between different goods) then there should be no reluctance to trade as no loss accompanies the trade of identical objects. Indeed, when Chapman (1998) offered participants a 5 cent incentive for exchanging two goods, she found that the rate at which goods were exchanged was as high as 79% when the two items were identical (e.g., two packs of crayons), which was significantly higher than when the exchange involved two similar (e.g., a pack of crayons and a pack of markers) or different (e.g., a pack of crayons and a box of bubble gum) objects, which were exchanged about 45% of the time. Similarly, Bar-Hillel and Neter (1996) found that about 90% of their participants agreed to exchange one pen for an identical pen plus 1 NIS (New Is-

raeli Shekels; \$1 is about 4 NIS). In contrast, only about 50% of their participants agreed to exchange lottery tickets with identical distribution when offered the same incentive, even though exchanging is the normative and dominant thing to do: a ticket-plus-money dominates a ticket-only when both tickets represent the same gamble.

When explaining the difference between pen and lottery ticket exchanges, Bar-Hillel and Neter suggested that, although the lottery tickets represent identical gambles *ex-ante*, their value might not be the same *ex-post*: one ticket could be a winner and the other could be a loser. It is then the fear of giving up a winning ticket that drives participants' reluctance to trade. When exchanging a ticket, the possibility of trading a winner for a loser readily comes to mind (Kahneman & Miller, 1986), preventing one from exchanging. Losing the lottery with an exchanged ticket is experienced as an out-of-pocket loss, whereas losing the lottery with the original ticket represents a forgone gain (“had I exchanged, I could have won”), and the former is weighted more heavily than the latter (Kahneman & Tversky, 1979; 1984). Moreover, since people regret their actions more than their omissions when negative results are expected (e.g., Ritov & Baron, 1995; but see also Connolly, Ordonez & Coughlan, 1997), losing after exchanging (an action) is likely to cause more regret than losing after not exchanging (an omission).

Anticipated regret has been shown to affect various decision contexts, such as choices between high-price/high-quality and low-price/low quality products (Simonson, 1992), decisions to engage in unsafe sex (Richard, van der Pligt & de Vries, 1996) and choices between gambles (Ritov, 1996). Additionally, increasing the salience of regret has been shown to lead to both more risk-avoidance and more risk-seeking, depending on which outcome the anticipated regret promotes (e.g., Zeelenberg et al., 1996).

Anticipated regret is clearly a strong, powerful, factor in various decision-making contexts (see, e.g., Roese, 1997; Roese, 2005; Zeelenberg & Pieters, 2007). An important question to consider then is what conditions increase or decrease the level of anticipated regret. Understanding these factors will contribute to our understanding of people's puzzling reluctance to exchange gambles, and in particular, lottery tickets with the same distribution which are identical *ex-ante* but may differ *ex-post*. Specifically, the potential *ex-post* difference (where one ticket may be the winner and one ticket may be the loser) may lead to anticipated regret when exchanging lottery tickets, but not when trading identical goods such as pens which are identical at all worlds. In a review of anticipated regret and its effects, Zeelenberg (1999) outlines several factors that might affect the salience of anticipated regret, such as decision difficulty, others' opinions,

and temporal resolution of all outcomes. Most relevant to the current paper is the last factor, namely, temporal resolution. Specifically, since people generally tend to discount outcomes that are distant in time and base their decisions on more proximal outcomes (e.g., Loewenstein, 1992), Zeelenberg proposes that the more distant and abstract outcomes will elicit less anticipated regret. Specifically, people might discount the potential regret resulting from a distant, abstract, outcome due to greater reliance on more proximal outcomes. A related discussion on temporal framing and experienced regret is provided by Gilovich and Medvec (1995) who report greater regret from action in the concrete short term, and greater regret from inactions in the abstract long term. Recently, Leach and Plaks (2009) demonstrated a similar pattern for abstract versus concrete framing, such that concrete (abstract) framing evokes greater regret in the short run (long run).

Building on the link between temporal concreteness and anticipated regret, I propose that related operationalizations of concreteness will also affect anticipated regret and, consequently, willingness to exchange gambles. Specifically, the vividness of the gamble (let it be a lottery ticket, an innovative product, or an unfamiliar vacation resort) is expected to affect how proximal or distant the gamble is. This, in turn would affect the associated regret with exchanging that gamble, such that less vivid gambles are perceived as more abstract and therefore evoke less regret (at least in the short term), which ultimately would affect willingness to exchange these gambles, as discussed in the next section.

## 1.2 The moderating role of vividness

Vividness, defined as being physically or temporally proximal, or as being emotionally appealing (Nisbett & Ross, 1980) has been widely studied in different decision-making and information-processing contexts (e.g., Taylor & Thompson, 1982; Kisielius & Sternthal, 1986; McGill & Anand, 1989). For example, Shiv and Huber (2000) report that when individuals are asked to think about anticipated satisfaction with certain products, they are more likely to choose the more vividly described products, such as a dream vacation. More generally, they argue that vividness enhances the ability to visualize future outcomes, which can lead to a shift of preferences. Building on this research, Nowlis, Mandel and McCabe (2004) find that vividness can enhance imagined enjoyment from consumption. They show that delaying imagined consumption (by having a time lag between presenting the product and asking consumers to imagine consuming it), leads to increased enjoyment only when the product is more vivid. Possibly, vividness makes the imagined, delayed, product, more proximal and imaginable.

In the context of the current paper, I argue that a product's vividness affects the cognitions that people associate with it as well as the counterfactuals they evoke. Specifically, since vividness enhances visualizing of future outcomes (e.g., Shiv & Huber, 2000), I propose that more vivid gambles, such as lottery tickets, will evoke more thoughts about possible future outcomes of the lottery (e.g., what one would do with the money if he wins). Thus, it would be easier to imagine a vivid (compared to non-vivid) ticket winning the lottery. Specifically, the more vivid, proximal, a ticket is, the easier it becomes for people to visualize future outcomes.

The greater proximity of vivid lottery tickets should also affect the anticipated regret when people are offered the opportunity to exchange their ticket. As reviewed earlier, proximal, as opposed to distant, events are likely to evoke more anticipated regret (Zeelenberg, 1999). Thus, when offered an incentive to exchange the lottery ticket with another ticket that has the same odds of winning, vivid tickets are likely to evoke greater regret associated with the possibility of exchanging the ticket and, subsequently, losing as a result. This greater anticipated regret, in turn, should prevent individuals from exchanging the tickets, leading to lower rate of exchange when the tickets are more vivid. Conversely, individuals should be more willing to exchange lottery tickets that are not vivid, as they evoke less anticipated regret. To summarize, this research tests the following hypotheses:

*The vividness-thoughts hypothesis (H1):* Vivid tickets evoke more thoughts about future consequences of the lottery,

*The vividness-regret hypothesis (H2):* Vivid tickets evoke more anticipated regret,

*The vividness-exchange hypothesis (H3):* As a result, vivid tickets are exchanged at a lower rate than non-vivid tickets.

## 1.3 Overview of studies

The studies described next were designed to test the hypotheses outlined above. The first study tests the vividness-thoughts hypothesis (H1), namely, that vivid tickets evoke more thoughts regarding potential outcomes of the lottery and increase the ease with which individuals imagine winning the lottery. The second study tests the hypothesis that vivid tickets are exchanged at a lower rate, compared to non-vivid tickets (the vividness-exchange hypothesis, H3). The last study tests the proposed mechanism, namely, anticipated regret, by testing whether (1) vivid tickets evoke more anticipated regret (the vividness-regret hypothesis, H2), (2) vivid tickets are exchanged at a lower rate (H3), thus replicating study 2, and (3) anticipated regret mediates the effect of vividness on exchange rate.

## 2 Study 1: Vividness increases lottery-related thoughts

Study 1 was designed to test the effect of a ticket's vividness on the level and nature of cognitive processing these tickets evoke. Specifically, it tested the vividness-thoughts hypothesis (H1), whether vivid tickets evoke more thoughts about future consequences of the lottery than non-vivid tickets. Additionally, if indeed vivid tickets evoke more thoughts about future outcomes of the lottery, then it should also be easier for respondents to imagine these future consequences of the lottery, such as what they would do with the money if they win the lottery. Consistent with the above analysis, it is expected that vivid tickets would evoke more thoughts about the lottery, and would make it easier to imagine possible outcomes related to winning the lottery. To test this prediction participants received either vivid or not-vivid tickets (operationalized through showing or concealing a ticket's color) and were asked to (1) list their thoughts about their ticket winning the lottery and (2) rate the ease of imagining their ticket winning.

### 2.1 2.1. Method

*Participants and design.* Seventy-six undergraduate students at a major West Coast University (58% females, mean age = 20.8) participated in the study, which was part of a series of experiments in general psychology and decision making. Participants were compensated \$7 and had a chance to win an additional \$5. The study had a one-factor ("yes color" versus "no color") between-subjects design.<sup>1</sup>

*Procedure.* All participants received the survey titled "lottery study". In the "yes color" condition (n=38), participants received either a green or yellow note, and were told that this is their lottery ticket. Participants in the "no color" condition (n=38) received a sealed envelope that contained either a green or yellow note, but they did not see the color of the ticket. Thus, for participants in the "yes color" condition the ticket was designed to be vividly presented, but for those in the "no color" condition the ticket was concealed and, thus, not vivid. To verify this, a manipulation check item (see below) was included in the study.

All participants were told that a fair coin with two sides—green and yellow—would be tossed at the end of the study. They were further told that if the coin falls on the "green" side, everyone holding a green ticket will receive \$5, whereas if the coin falls on the "yellow" side, everyone holding a yellow ticket will receive \$5. All

<sup>1</sup>The color of the ticket—yellow versus green—was also manipulated between-subjects. In all analyses below this factor did not have an effect and is not discussed further.

participants were then asked to list their thoughts about their ticket potentially winning the lottery. Specifically, they were told "In the space below please list all of your thoughts about your ticket potentially winning the lottery. Please list each thought on a separate line. Simply write what comes to mind—no need to fill all lines." There were a total of ten blank lines.

All participants then answered the following questions, all on a 1 (not at all) to 7 (very much) point scale: "How vivid is the lottery ticket you received?" (manipulation check); "How easy it is for you to imagine what you will do with the money, if you win?" and "How easy it is for you to visualize what you will do with the money, if you win?" (two imagination items). At the last part the experimenter tossed the coin to conduct the lottery such that a separate coin toss was conducted for each participant. Participants in the "no color" condition were then asked to open the envelope to see what color they had. All participants were then debriefed and paid, and those who won the lottery (i.e., the coin fell on the side that matched the color of the note) received an additional \$5.

### 2.2 Results and discussion

*Manipulation checks.* As expected, when participants saw the color of the lottery ticket they rated the ticket as more vivid ( $M_{\text{yes color}} = 5.16$  [SD= 1.8]), compared to participants who received the ticket that was concealed in an envelope ( $M_{\text{no color}} = 3.65$  [SD= 1.6];  $\beta = 1.5$ ,  $t(74) = 3.7$ ,  $p < .005$ ).

*Thoughts analysis.* The number of thoughts each participant listed was counted, creating a score between 0 (no thoughts at all) to 10 (10 thoughts listed). Consistent with the hypothesis, participants who saw the color of the ticket listed on average more thoughts than those who did not see the color of the ticket ( $M_{\text{yes color}} = 3.13$  [SD= 1.5],  $M_{\text{no color}} = 2.4$  [SD = 1.2]). A regression analysis with the experimental manipulation as the independent variable confirmed that this difference was significant ( $\beta = 0.66$ ,  $t(74) = 2.08$ ,  $p < .05$ ).

*Ease of imagination analysis.* The two items (easy to imagine and easy to visualize) were highly correlated ( $r = 0.88$ ,  $p < .005$ ) and were combined into a single imagination measure. As expected, participants who saw the color of the ticket reported it was easier to imagine what they would do with the money if they won ( $M_{\text{yes color}} = 5.16$  [SD= 1.9]), compared to those who did not see the color of the ticket ( $M_{\text{no color}} = 4.35$  [SD= 1.8]). Regression analysis revealed the effect is marginally significant ( $\beta = 0.8$ ,  $t(74) = 1.85$ ,  $p = .069$ ).

To summarize, the first study establishes the effect of ticket's vividness on the level of processing and on the ease of imagining future consequences of winning the lottery. In particular, when individuals saw the color of the

lottery ticket (which eventually determined whether they would win or not), they perceived the ticket as more vivid, they generated more thoughts about the ticket potentially winning the lottery, and they found it easier to imagine what they would do with the money if they win the lottery, compared to those individuals who did not see the color of their ticket. This supports the assumption outlined above, that less vivid tickets represent more abstract, distant, stimuli. More proximal, concrete stimuli generate more thoughts and increase the ease of imagining lottery-related outcomes. The next study examines whether the ticket's vividness also affects individuals' willingness to exchange them.

### 3 Study 2: Vividness decreases exchange rate

The purpose of this study was to test the effect of a ticket's vividness on individuals' willingness to exchange them. As discussed above, when the ticket is less vivid, as when its color is not seen, individuals will be more likely to exchange it with a ticket with the same distribution when offered an incentive to do so (see the vividness-exchange hypothesis, H3, above). Consistent with the above analysis and the results of Study 1, less vivid tickets generate fewer thoughts, making it harder to imagine the consequences of winning the lottery and, as will be tested in Study 3, evoke less anticipated regret. Therefore, individuals should be more willing to exchange less vivid tickets when offered an incentive to do so.

#### 3.1 Method

*Participants and design.* One hundred and thirty three undergraduate students at a major Israeli University participated in exchange for a chance to win 15 NIS (approximately \$4 at the time the experiment was conducted) in a one factor ("yes color" versus "no color") between-subject design<sup>2</sup>.

*Procedure.* Two experimenters entered four classrooms (all from the same student population) as they ended and asked students to voluntarily participate in a short experiment, in which they had a 50% chance of winning 15 NIS. Then, the experimenters distributed tickets in one of two colors: yellow or green. As indicated above, the study had two conditions: "yes color" and "no color". As in Study 1, in the "yes color" (vivid) condition (n=59), participants saw the color of the lottery ticket. In the "no

color" (not vivid) condition (n=74), participants did not see the color of the ticket, as the tickets were within a sealed envelope. Participants were told that each color would be redeemable for either 0 or 15 NIS, to be determined by the flip of a coin which had one yellow and one green side. Participants were told that if the coin falls on "yellow", yellow tickets would be redeemable for 15 NIS, and green tickets for nothing; if the coin falls on "green", then the reverse would occur. Thus, as in Study 1, exactly one color would be the "winner" and the other color the "loser".

Before tossing the coin, the experimenter announced: "Now each one of you may exchange your ticket. If you agree, you will receive a new ticket in a different color and 2 NIS." Participants were asked to indicate in writing whether they agreed to exchange their ticket or not. The experimenter approached each student, exchanged to a differently colored ticket and paid when necessary. Note that since all students were asked to indicate in writing their decision to exchange or not and the lottery was conducted only after these notes were collected, the length of the experiment was independent of whether the participant chose to exchange or not. At the last stage, one student volunteered to flip the coin. Participants holding sealed envelopes were then allowed to open the envelopes. The experimenter announced the results of the lottery (i.e., which color won) and paid accordingly.

#### 3.2 Results and discussion

Consistent with the hypothesis, vivid tickets (i.e., tickets which had their color exposed) were exchanged at a lower rate than non-vivid tickets (tickets which had their color concealed). Specifically, while 80% in the "no color" (i.e., not vivid) condition agreed to exchange, only 63% in the "yes color" (i.e., vivid) agreed to exchange ( $\chi^2(1) = 4.7, p < .05$ ). This result replicates the basic reluctance to exchange lottery tickets with identical distribution reported by Bar-Hillel and Neter (1996), where only 50% of their respondents agreed to exchange lottery tickets. Moreover, the rate of exchange of non-vivid tickets in the current experiment (80%) was similar to that of pens (90%) as reported by Bar-Hillel and Neter (1996). Thus, importantly, this study adds to their finding by showing that when the tickets are not vivid, as when they are concealed in an envelope, respondents are significantly more willing to exchange them. While this study demonstrates the behavioral consequences of manipulating a ticket's vividness, it does not test the mechanism through which this effect occurs. The study described next tests the proposed mechanism, namely anticipated regret.

<sup>2</sup>As in Study 1, the color of the ticket—yellow versus green—was also manipulated between-subjects. In all analyses below this factor did not have an effect and is not further discussed.

## 4 Study 3: The mediating role of anticipated regret

The last study was designed to address three main goals. First, it aimed to replicate the effect found in Study 2 in a different lottery setting. Specifically, instead of varying the tickets' color, each lottery ticket in this study was assigned a number. A ticket's vividness was then manipulated by whether participants were shown their ticket number or not.

A second goal of this study was to test the role of anticipated regret in determining individuals' willingness to exchange their lottery ticket. As discussed above, it is proposed that anticipating the regret that would occur from exchanging the lottery ticket and losing as a result, prevents individuals from proceeding with a ticket exchange. However, according to the above theoretical analysis, less vivid tickets are expected to evoke less regret, which in turn should increase the probability of exchanging them.

To test this proposed mechanism of anticipated regret, participants received a vivid (number shown) or non-vivid (number not shown) lottery ticket. Participants were then asked to assume that they have the opportunity to exchange their ticket with another that has the same odds of winning. In addition to indicating their decision, they were asked to report how much they would expect to regret exchanging the ticket. This allows a test of the role of anticipated regret as a mediator. Specifically, it is expected that participants will be more likely to exchange non-vivid tickets (those tickets which had their numbers hidden), thus replicating Study 2. It is also expected that non-vivid tickets will evoke less anticipated regret (per the vividness-regret hypothesis, H2, above). Importantly, it is expected that anticipated regret would mediate the effect of vividness on exchange rate.

Finally, the third goal of this study was to generalize our investigation to a heterogeneous, non-student population. It was therefore conducted using a national online pool.

### 4.1 Method

*Participants and design.* Sixty-seven participants (33% male, mean age = 36) were recruited through an online respondent pool to participate in a one-factor ("yes number" versus "no number") between-subject design, in exchange for a chance to win a \$50 gift certificate at a major online retailer.

*Procedure.* All participants were told that they would be assigned a number by the computer. They were further told that at the end of the study a number would be picked at random and the participant who has that number

would receive the \$50 gift certificate. In the "yes number" (vivid) condition (n=37), participants were told on the next screen what their number was. In the "no number" (not vivid) condition (n=30), participants were told that a number has been chosen for them by the computer and that they would learn their ticket number only at the end of the study. Thus, vividness was operationalized by either disclosing the ticket number to participants (making the ticket vivid), or not disclosing the ticket number (making the ticket not vivid). As a manipulation check, all participants then evaluated how vivid the ticket was on a 1 (not at all) to 7 (very much) scale, as in Study 1.

Following the manipulation check, participants were asked to assume that they had the opportunity to exchange their current ticket for a ticket with a different number and that those who agreed to the exchange would receive a \$5 bonus, regardless of the lottery's outcome. Subsequently, participants were asked to indicate whether they would agree to exchange their number or not. Finally, participants were asked to indicate on two 7-point scales [1 (not at all) to 7 (very much)], the extent to which they would regret exchanging the number if they find out that their original number won (meaning that if they had not exchanged then they would have won for sure), and the extent to which they would regret not exchanging their number if they find out they did not win the lottery (meaning that if they had exchanged then they might have won). Participants were then thanked, and the gift card was emailed to the winner.

### 4.2 Results and discussion

*Manipulation checks.* As expected, those who did not know the number of the lottery ticket rated the lottery ticket as less vivid ( $M_{\text{no number}} = 2.77$ ) than those who knew the ticket number ( $M_{\text{yes number}} = 4.56$ ,  $t(65) = 3.8$ ,  $p < .005$ ). This generalizes the operationalization of vividness beyond using the colored tickets as in previous studies.

*Exchange analysis.* Consistent with the vividness-regret hypothesis (H2), participants who knew what their number was at the time of the exchange opportunity were less likely to indicate willingness to exchange their ticket compared to those who did not know their number. Specifically, while 90% in the "no number" (i.e., not vivid) condition said they would agree to exchange, only 73% in the "yes number" (i.e., vivid) condition said so. In logistic regression, with the vividness manipulation as the independent variable and willingness to exchange as the dichotomous dependent variable, the effect was significant one tailed ( $\chi^2 = 3.07$ ,  $p = .04$ , uncorrected for continuity).

*Anticipated regret analysis.* Participants who knew what their number was, anticipated feeling greater regret

if they would exchange and found out their original ticket later won ( $M_{\text{yes number}} = 5.73$ ,  $SD = 1.67$ ) compared to participants who did not know their number ( $M_{\text{no number}} = 4.72$ ,  $SD=1.98$ ). Regression analysis revealed a significant effect for the vividness manipulation ( $\beta = 1.004$ ,  $t(65) = 2.23$ ,  $p < .05$ ). In contrast, anticipated regret from not exchanging and not winning was not different across the conditions ( $M_{\text{yes number}} = 3.9$ ,  $SD = 2.2$ ;  $M_{\text{no number}} = 4.1$ ,  $SD=2.2$ ,  $t(65) < 1$ ). This suggests that a ticket's vividness affects only regret resulting from exchanging and losing as a result, but does not affect regret resulting from not exchanging and not winning. Indeed, as reviewed above, the former type of regret is a stronger predictor of reluctance to exchange gambles.

*Mediation analysis.* In order to test whether anticipated regret indeed represents the underlying process for the vividness manipulation, the standard mediation procedure, outlined by Baron and Kenny (1986), was performed. First, as indicated above, the significant effect of the vividness manipulation on the outcome variable, willingness to exchange, was established ( $\chi^2 = 3.07$ ,  $p = .04$ , one tailed and uncorrected). The effect of the vividness manipulation on the proposed mediator, anticipated regret, was also established above ( $\beta = 1.004$ ,  $t(65) = 2.23$ ,  $p < .05$ ). Additionally the mediator was a significant predictor of the outcome variable, willingness to exchange (in logistic regression with willingness to exchange as the dependent variable,  $\chi^2 = 6.2$ ,  $p < .05$ ). Specifically, those who agreed to exchange reported lower levels of anticipated regret ( $M = 5.08$ ,  $SD = 1.8$ ) compared to those who did not agree to exchange ( $M = 6.62$ ,  $SD = 0.9$ ). Importantly, the effect of the vividness manipulation on the willingness to exchange was no longer significant when the proposed mediator, anticipated regret, was included in the regression model ( $\chi^2 = 0.8$ ,  $p > .3$ ), suggesting that anticipated regret from exchanging and losing as a result fully mediates the vividness effect.

*Additional analysis.* To further understand the role of vividness in determining willingness to exchange, I tested whether perceived vividness (i.e., the manipulation check item) mediates the effect of the vividness manipulation on willingness to exchange. As reported above, the vividness manipulation had a significant effect on the outcome variable, willingness to exchange ( $\chi^2 = 3.07$ ,  $p = .04$ ), and a significant effect on the proposed mediator, perceived vividness ( $t(65) = 3.8$ ,  $p < .005$ ; see manipulation check section above). To complete this mediation analysis, it was confirmed that the proposed mediator, perceived vividness, was a significant predictor of willingness to exchange (in logistic regression, Wald  $\chi^2 = 6.74$ ,  $p < .05$ ). Importantly, the effect of the vividness manipulation on willingness to exchange was no longer significant when controlling for perceived vividness in the logistic model (Wald  $\chi^2 = 0.2$ ,  $p > .5$ ). However, this analy-

sis should be interpreted with caution given the proximity between the independent variable (i.e., the vividness manipulation) and the proposed mediator (i.e., the manipulation check item).

To summarize, this study replicates the behavioral effect of vividness on willingness to exchange tickets using a different, possibly more realistic, lottery settings than that used in the previous studies and with a heterogeneous, non-student, population. More importantly, this study demonstrates the role of anticipated regret as the mechanism underlying willingness to exchange. Specifically, anticipated regret mediates the effect of a gambles' vividness on willingness to exchange gambles with identical odds.

## 5 General discussion

It is the last stage of the television show "Deal or No Deal" (2010). All cases have been opened except for the contestant's and one more case. The contestant has to decide whether to keep her case or switch to the other unopened case. Both cases represent a gamble and one is redeemable for a bigger prize than the other. What would she do? Keeping all else equal (i.e., history of the game, any relevant individual differences), would the vividness in which the gambles are represented (e.g., the vividness of the case), affect her decision? This research suggests that it would.

More broadly, many of our everyday decisions can be represented as gambles: choosing an exotic, unfamiliar entrée at a restaurant, choosing a seat on a plane, and even getting married. As such, an important question is, would we exchange gambles, such as lottery tickets, if offered an incentive to do so? Under what conditions might people be more willing to exchange and why?

Exchanging gambles may evoke regret, as individuals might lose as a result of the exchange. Conditions that reduce anticipated regret should therefore increase an individual's willingness to trade one gamble for another. As illustrated in this paper, one such condition is when a gamble (e.g., a lottery ticket) is presented to be more or less vivid.

The first study shows that less vivid lottery tickets, such as tickets concealed in envelopes, both evokes fewer thoughts about the ticket potentially winning the lottery and makes it more difficult to imagine the ticket winning the lottery. The second study finds that less vivid lottery tickets are exchanged at a higher rate when respondents are offered an incentive to exchange. The last study demonstrates the mechanism through which this effect occurs, namely, anticipated regret. In particular, it shows that less vivid lottery tickets evoke less anticipated regret from exchanging and losing as a result. This reduced an-

anticipated regret, in turn, drives the increased willingness to exchange one ticket for another.

This research contributes to our understating of factors that increase or decrease anticipated regret when faced with an option to exchange gambles, and demonstrates the behavioral consequences of manipulating factors such as a gamble's vividness. Thus, while previous research (Bar-Hillel & Neter, 1996) found that people are quite reluctant to trade lottery tickets, this research shows that when the gamble's vividness is reduced, people are as willing to trade them as they would trade other identical goods (Chapman, 1998).

Within the experiments reported here, vividness was operationalized through two different methods—showing or concealing the lottery ticket's color and showing or concealing the ticket's number. Future research can manipulate the ticket's vividness in other ways, such as manipulating whether the gamble will be played out in the near future (thus making it more vivid) or in the far future (thus making it less vivid). It is expected that people would be more willing to exchange less vivid, long term, gambles and more reluctant to exchange more vivid, short term, gambles.

While these experiments focused on the role of vividness within lotteries, the findings of this research can be applied to other settings, such as when consumers are deciding about purchasing insurance or playing the stock market. Buying insurance is essentially a gamble, as consumers are choosing how much they are willing to risk (i.e., how high of a premium they are willing to pay), to avoid a possible loss. Once an insurance plan is chosen, would consumers switch to another plan, if offered an incentive to do so? Our research suggests that if the insurance plans are represented less vividly, e.g., by manipulating the display of the plan's name or plan-related images, consumers would be more willing to do so. A similar argument applies to the stock market. Possibly, consumers would be more willing to switch from less vivid stocks, such as stocks whose name is not displayed, or whose description is less detailed.

As medical decisions often represent gambles and involve anticipated regret (e.g., Connolly & Reb, 2005; Chapman & Coups, 2006), the findings of this paper can be applied in this domain too. For example, ultrasound scans for unborn babies presumably enhance the babies' vividness. While obviously babies cannot be exchanged, one can ask whether ultrasound scans decrease the likelihood of taking an action (e.g., pregnancy termination), if warning signs occur? While the current research dealt with very simple decisions of minor consequences, future research could examine how these findings can be applied in more complicated settings of such medical decisions.

Finally, this research raises the question, of when do people are more likely to do the more "rational" thing. In

the settings of the experiments reported here, exchanging was the rational action as respondents were offered a sure incentive to trade their ticket with another ticket that had the same chances of winning. The finding that decreasing the gamble's vividness increased the likelihood of doing the "rational" thing suggests that decreasing vividness, or, more generally, eliminating information that is not essential to the decision itself, may lead individuals to act more rationally and avoid decision biases. For example, would people be less likely to show the status quo bias (Samuelson & Zeckhauser, 1998) when the options are described less vividly? Would people be more risk-seeking, and be more likely to choose the riskier, higher expected-utility option, when the options are presented in a more abstract manner? Similarly, it is possible that people will be less likely to exhibit choice deferral (i.e., the tendency to defer making a choice even when all options are sufficiently attractive; e.g., Dhar, 1997) when the options are described in a less vivid manner, such that only information that is essential to understanding the choice set (e.g., the attributes values) is given. In the current consumption environment, where many decisions are made online in information-rich environments, it is even more relevant to understand the role vividness and information-presentation mode more generally play in eliminating these biases.

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