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The Joy of Lottery Play: Evidence from a Field Experiment

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Abstract

We conducted a field experiment to increase our understanding of lottery participation. Using representative data for the Netherlands, we find that lottery participation increased the happiness of participants before the draw. Winning a small prize had no effect on happiness. Our results indicate that people may not only care about the outcomes of the lottery, but also enjoy the game. Accordingly, we conclude that lottery play has a utility value in itself and part of the lottery ticket is consumed before the draw.

Keywords: lottery play, happiness, field experiment

JEL-codes: C93, I31

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1 Introduction

The average return on lottery tickets is typically just over 50%, which is considerably lower than the average return on other gambling games, such as horse racing, blackjack and roulette (Clotfelter and Cook (1990)). Although buying lottery tickets is not a rational investment from a financial point of view, lottery play is the most popular form of gambling and in most Western countries the majority of the population participates at least once a year in a lottery (Kearney (2005); Garvía (2007)). In 2015, the sales in the European lottery sector amounted to approximately €80 billion (The European Lotteries (2015)), with European citizens spending on average €100 per person per year on lottery tickets. To increase our understanding of lottery participation we performed a field experiment randomly providing free lottery tickets to some participants of an existing household panel survey.

In the economics literature, several explanations for widespread lottery play have been put forward. Already at the end of the 1940s, Friedman and Savage (1948) argued that lottery play offers an opportunity to win substantial amounts of money and improve one's socio-economic status at a relatively low stake. Following the Friedman-Savage hypothesis and its later additions and modifications (e.g, Pryor (1976); Brunk (1981); Hartley and Farrell (2002); Nyman et al. (2008)), lottery play is considered rational when it offers the opportunity to improve one's socioeconomic status or lifestyle when there are few or no other options to realize this otherwise. In prospect theory, widespread lottery play has been attributed to irrational beliefs that people uphold regarding their chances of winning a lottery since people tend to overestimate the small chances of winning the lottery (Kahneman and Tversky (1979)). In this regard, it has been found that lottery ticket purchases are primarily based on the size of the jackpot rather than the chances of winning the lottery (Camerer (2000)).[1]

Although there is some empirical support for both the Friedman-Savage theory and prospect theory, many scholars argue that these theories do not fully explain people's propensity to gamble. In particular, the Friedman-Savage theory suggests that lottery is

[1] Farrell and Walker (1999), studying data from the UK National Lottery, find a large price elasticity, i.e. a large response in the sales of lottery tickets to the size of the jackpot. They also find a small income elasticity. A recent overview of relevant lottery studies is presented in Perez and Humphreys (2013).

predominantly played among the low and middle social classes. Although indeed poorer people tend to spend a larger proportion of their income on lottery tickets (Beckert and Lutter (2013)), the theory cannot explain why people play the lottery also in those parts of the income distribution where additional wealth does not result in additional expected utility (Walker (1998), Perez and Humphreys (2013)). According to prospect theory, some people participate in lottery play because they largely overestimate their chances of winning. However, the theory cannot explain widespread gambling either because most lottery participants have quite rational expectations regarding the outcome of a draw (Forrest et al. (2000)).

A different explanation for widespread lottery play that has received less empirical attention in the economics literature is that lottery play itself has a utility value (Hirshleifer (1966); Eadington (1973); Loewenstein (1987); Conlisk (1993); Le Menestrel (2001)).[2] In other words, there is a non-monetary or process utility of participating in a lottery. Lottery players may experience positive emotions before and after the draw. Positive emotions before the draw may result from one's hope for a happy life, from the fun and excitement of the game as well as from social bonding activities when the lottery is played together with family or friends (Forrest et al. (2000); Guillén et al. (2011); Kocher et al. (2014)). Positive emotions after the draw may originate from winning a prize, even when the prize is only very small and lower than the purchasing price of the lottery ticket. In addition to the monetary utility of winning a prize, there may also be a non-monetary utility of winning unrelated to the magnitude of the prize (Sheremeta (2010)). Since most lotteries have many small prizes and the chance of winning a prize is high (in the lottery in our experiment the probability to win a prize is 50%), this could explain the widespread popularity of lottery play, including (seemingly) irrational behavior and the fact that lottery play takes place across the whole income distribution.

While the utility of gambling model has considerable appeal, there is limited empirical evidence in support of this model (Perez and Humphreys (2013)). This is probably due

[2]Another explanation for the popularity of different gambling games is that lottery play is not perceived as gambling and relatively free of social stigma (Ariyabuddhiphongs (2011)), unlike for example horse-racing betting and casino play. In addition, lotteries are more accessible compared to other forms of gambling (Felsher et al. (2004)) and characterized by an extreme skewness of prizes (there is often only one extreme big prize), which is thought to make lotteries relatively attractive (Garrett and Sobel (1999)). However, a further discussion on the popularity of the lottery compared to other forms of gambling is beyond the scope of this paper.

to the difficulty of identifying an appropriate observable proxy for the procedural utility generated by playing the lottery (see also, Nyman et al. (2008)). Recently, happiness measures, as suitable indicators of procedural utility measures, have been suggested and applied in economic research (Frey and Stutzer (2002)). Burger et al. (2016), using the British Gambling Prevalence Survey 2010, found a small positive effect of lottery participation on happiness for individuals who engage in lottery play for fun. Bruyneel et al. (2005) reported that the purchase of lottery tickets is associated with reducing negative mood. Along similar lines, in a lab experiment Kocher et al. (2014) identified hope and thrill as determinants of the popularity of Lotto tickets. Other studies showed a positive relationship between the hope of winning and lottery participation (Forrest et al. (2000); Clarke (2005); Ariyabuddhiphongs and Chanchalermporn (2007)). These findings are also echoed in studies that examined the motives for lottery play: people do not only play for the money, but also for social bonding and fun (Miyazaki et al. (1999); Burger et al. (2016)).

Regarding procedural utility after the draw, originating from winning a small prize, research on participation in contests has shown that there is a non-monetary utility of winning. Participants deliver a positive effort in a contest even with an expected prize value of zero (Sheremeta (2010); Brookins and Ryvkin (2014)). The existence of a non-monetary utility of winning is also supported by the positive association between the number of small prizes and lottery sales (Beenstock and Haitovsky (2001)). However, the non-monetary utility effects of winning may be short-lived. Some studies find that even large lottery wins have no long run effect on subjective well-being (Brickman et al. (1978); Kuhn et al. (2011)). Nevertheless, evidence on this topic is inconclusive since other studies find a positive relationship between lottery wins and subjective well-being e.g. Gardner and Oswald (2007) and Apouey and Clark (2015).[3]

Whereas in previous studies lottery data were often used to investigate the effect of large exogenous income shocks on behavior of lottery winners, we focus on understanding

[3]Winning a lottery may also affect subjective well-being by affecting labor market behavior of individuals. Imbens et al. (2001) studying labor supply effects of winning the Megabucks lottery in Massachusetts, found significant income effects implying that prize winners reduce their labor supply substantially. Cesarini et al. (2016) studying winners of Swedish lotteries found significant responses both at the intensive and extensive margin of labor supply. Picchio et al. (2018) analyzing data from Dutch State Lottery big prize winners found that their labor earnings decreased initially but employment was not significantly affected.

participation in lotteries. We investigate the utility of lottery play using a field experiment. Some randomly selected participants in a regular panel survey were provided with a free ticket of the Dutch State Lottery while others were not.[4] We assess the procedural utility of lottery play by comparing the subjective well-being of lottery players and non-lottery players at three points in time: (1) before receiving a (free) lottery ticket, (2) after receiving a lottery ticket but before the draw, and (3) after the draw. To rule out the possibility that the utility effect we observe is related to receiving a free lottery ticket, and to account for the fact that some people purchased a lottery ticket themselves, we compare four groups of people: with a free lottery ticket, with a purchased lottery ticket, with both a free and purchased lottery ticket, and without a lottery ticket.

Following the recent behavioral economics and happiness economics literature (e.g., Kahneman et al. (1997); Oswald (1997); Frey and Stutzer (2002, 2005); Layard (2005)), we measure the procedural utility of lottery play as the gain in happiness that people derive from lottery play. We examine both the procedural utility of lottery play before and after the draw. We hypothesize that before the draw, players may gain procedural utility from the excitement of playing the game, the hope of winning a large prize, as well as social bonding, while after the draw players may gain procedural utility from winning a small prize (which was in almost all cases smaller than the original retail price of the ticket).

Our paper contributes to the economics literature on lottery play and consumption in several ways. First, although many economic studies have addressed the utility gains of lottery wins, this is to the best of our knowledge the first paper to causally identify the procedural utility of lottery play using a large-scale field experiment. Second, in our study we take into account that lottery players may gain procedural utility before and after the draw. We find that lottery participation increases happiness before the draw, but winning a small prize has no effect on happiness. These results indicate that there is a procedural utility of gambling in the sense that people do not only care about winning prizes, but also enjoy the game. We conclude that lottery play has a utility value in itself. Third, and more generally, our article indicates that consumption outcomes are

[4]The State Lottery is the largest draw game lottery in the Netherlands. In contrast to other games in the lottery industry (e.g. Lotto, Toto, or scratch cards), a draw game lottery is passive since players cannot choose exact numbers and there is often a long time between draws.

not the only source of utility, but consumers also enjoy procedural utility, which is in turn a driving force behind consumer behavior (Frey and Stutzer (2002)).

The remainder of our paper is organized as follows: Section 2 provides an overview of the experimental design of our study. Section 3 presents our empirical results on procedural utility before the draw while section 4 presents parameter estimates for the non-monetary effects of winning a small prize. Section 5 concludes.

2 Experimental Design and Data

For our field experiment we used the CentERpanel, a household panel that is maintained by CentERdata, a research institute affiliated with Tilburg University. The panel is representative of the Dutch population and exists since 1991. Currently, the CentERpanel contains well over 2,000 households. Panel members use their computers or smartphones to participate in the study and complete questionnaires on a weekly basis. In our study, 1,300 people randomly selected panel members were approached to participate in the field experiment.

Participants in our experiment filled out a questionnaire at three moments in time. The first questionnaire, held between April 17-28, 2015 (T_1), was intended to obtain information about the participants' baseline level of subjective well-being, their gambling behavior – particularly with regard to lottery games – and their socio-demographic characteristics and personality. Subsequently, a large part of the respondents received a free lottery ticket to participate in the State Lottery.[5] This ticket was sent approximately one week before the State Lottery draw of May 10, 2015. Next, all participants were asked to fill out a second questionnaire between May 6-9, 2015 (T_2) with questions about their subjective well-being and thoughts about lottery play. After the draw of May 10, respondents were asked to complete a third questionnaire between May 11-12, 2015 (T_3)

[5]Individuals can participate in the State Lottery in the Netherlands by buying separate lottery tickets or through a subscription. About half of the individuals who bet in the State Lottery do so through a subscription. There are monthly draws of winning tickets and sometimes special draws are organized at the end of the year or on other occasions. For participants, there is choice between "full" tickets of €15 and "partial" tickets of €3 which pays one fifth of the full amount if it is a winning ticket. Bigger prizes in each draw range from €1,000 to €1 million. Each draw also has smaller prizes, ranging from €5 to €1,000. In our experiment, at most one person per household could participate. Two respondents in our experiment returned the lottery ticket for religious reasons.

about their subjective well-being, the outcome of the lottery draw (whether the participant won a prize or not), and thoughts about lottery play. In total, 1,142 participants finished the first two stages of the experiment, while 1,097 participants filled out all three questionnaires. We base our analysis on these two groups.

To examine the effect of lottery play on procedural utility, we distinguish four groups: (1) people without ticket, (2) people with only a free lottery ticket, (3) people with only a purchased lottery ticket, and (4) people with both a free and purchased lottery ticket. This distinction is important for two reasons. First, in our field experiment we cannot rule out that people purchase or have already purchased tickets for the lottery draw. Giving away free tickets for the lottery draw, we try to bypass the problem that our results could be distorted by a selection of happy people or thrill-seekers into lottery play. Second, having only participants with a free ticket and no purchased tickets would also have been a problem, since the procedural utility of participants can originate from obtaining the free ticket itself, when this is considered as a small gift. Accordingly, the source of the procedural utility that is potentially obtained can also originate from the receipt of a free ticket. Overall, we have in our field experiment 122 participants with no ticket, 673 participants with only a free ticket, 49 participants with only a purchased ticket, and 298 participants with both a free and purchased ticket. The main reason for the unequal distribution of the groups is that one of the objectives of the study was to investigate how people that never play the lottery experience lottery play.

We capture procedural utility with momentary happiness, which is measured by the following question: 'How happy do you feel today?' with answer categories ranging from 1 (very unhappy) to 10 (very happy).[6] In particular, we are interested in how people's daily happiness develops around the lottery draw. On average, the participants in the field experiment scored 7.6 in the first questionnaire, 7.5 in the second questionnaire, and 7.4 in the third questionnaire. These scores are comparable to the average happiness obtained in the Netherlands from other Dutch surveys (Veenhoven (2018)). Declining happiness scores have also been found in other panel studies where through panel conditioning people report lower happiness scores the longer they participate in a panel (Chadi (2013);

[6]We use a more momentary measure of subjective well-being instead of the more stable life satisfaction measure, since procedural utility is better operationalized by survey questions that capture 'happiness in life' than survey questions that capture 'happiness with life' (Veenhoven (2000)).

van Landeghem (2014)).

As control variables, we included several personal and personality characteristics as well as information on when the respondents answered the questionnaire. The personal characteristics we included are gender, age, income, educational attainment, occupational status, marital status, household composition, and characteristics of the place of residence. The personality characteristics we included are based on answers to questions regarding level of materialism, locus of control, and degree of optimism. In addition, we controlled for the general gambling behavior of the respondents as well as the date on which the respondents completed their questionnaires and how they experienced the survey questionnaires. Finally, we controlled for changes in life satisfaction in the period under observation to account for possible events that affected people's happiness with life over the period studied. Nevertheless, it should be noted that the evaluation of life satisfaction is – like happiness today – also dependent on momentary moods. Hence, the models in which we control for life satisfaction changes can be considered as conservative estimates for the procedural utility of lottery play.[7]

As a robustness check, we investigated whether the joy of lottery play was contingent on thoughts about the lottery draw and positive and negative feelings regarding the draw, and willingness to pay for a lottery ticket. In our survey at T_2, we asked the respondents how often they thought about the State Lottery. Answer categories ranged from 1 (never) to 7 (all the time). In addition, lottery players were asked the following question before the draw (T_2): 'What emotions do you experience when you think about your participation in the draw of the State Lottery of May 10th?'.[8] Respondents indicated on a scale from 1 (not at all) to 7 (completely) to what extent they felt happy, hopeful, excited, curious, trusting, amused, and friendly (positive emotions) as well as to what extent they felt worried, sad, annoyed, disappointed, regret, distant, and indifferent (negative emotions). Willingness to pay was examined in the survey at T_1, where participants had to make a choice between receiving a small sum of money or a lottery ticket with a retail price of €15 in a thought experiment. An overview of the variables included in the analysis is

[7] Although controlling for life satisfaction takes in changes in one's life that cannot be attributed to obtaining a lottery ticket between T_1 and T_2, this variable is endogenous because of the halo effect: people in a better mood, evaluate all aspects of life and life in general higher.

[8] A similar question was asked in T_3 where participants also had to reflect on their emotions regarding the draw of May 10.

presented in Appendix A, while the questionnaires are available in Appendix B.

3 Procedural Utility before the Draw

We start our analysis by investigating the presence of procedural utility before the draw. Through linear regression, we related happiness to the type of lottery ticket people possessed (purchased, free or both) and to a series of control variables. To remove observed and unobserved time-invariant characteristics from the analysis, we used as dependent variable the change in happiness between survey 1 and survey 2, $\Delta H_{12,i}$. We assume the following relationship:

$$\Delta H_{12,i} = \alpha_1 + \beta_1 F_i + \beta_2 B_i + \beta_3 C_i + \beta_4 X_i + \beta_5 \Delta S_{12,i} + \beta_6 \Delta LS_i + \varepsilon_{12,i} \qquad (1)$$

where α_1 represents a vector of interview date fixed effects, i refers to an individual, F is a dummy variable for whether or not a free lottery ticket was received (but no lottery ticket was bought), B is a dummy variable if no free lottery ticket was received but one was bought, C is a dummy variable if individual had received a free lottery ticket in addition to having bought one, and Δ indicates the first difference of a variable. Furthermore, X is a vector of personal and personality characteristics, S if a vector of survey characteristics and LS represents life satisfaction. Finally, β_1 to β_6 are our (vectors of) parameters and ε_{12} is an error term.

In case of procedural utility before the draw, we expect that the change in happiness between T_1 and T_2 is significantly larger for lottery participants than for non-lottery participants. Furthermore, we expect that the change in happiness between T_1 and T_2 is not significantly larger for lottery participants with a free ticket than for lottery participants with a purchased ticket. If not, the increase in happiness would be related to a monetary transfer, i.e. receiving the lottery ticket for free.

Table 1 provides the OLS parameter estimates for the change in happiness between T_1 and T_2.[9] The first column shows the parameter estimates of the lottery ticket effect on the change in happiness without including control variables. On average, people with a lottery

[9]The full estimation results can be found in Appendix C.

Table 1: **Parameter Estimates Change in Happiness between T_1 and T_2**

Panel A					
Lottery Ticket ($\beta_1 = \beta_2 = \beta_3 = \beta_1^*$)	0.40 (0.12)**	0.41 (0.12)**	0.40 (0.13)**	0.37 (0.13)**	0.25 (0.11)*
R^2	0.01	0.04	0.04	0.07	0.20
Panel B					
Free Ticket (β_1)	0.38 (0.13)**	0.40 (0.13)**	0.40 (0.13)**	0.37 (0.13)**	0.26 (0.12)*
Purchased Ticket (β_2)	0.56 (0.20)**	0.61 (0.21)**	0.57 (0.22)**	0.52 (0.21)*	0.39 (0.21)#
Free and Purchased Ticket (β_3)	0.40 (0.13)**	0.42 (0.14)**	0.38 (0.14)**	0.34 (0.14)*	0.19 (0.13)
R^2	0.01	0.04	0.04	0.07	0.20
β_1=β_2 (p-value)	0.31	0.26	0.36	0.38	0.52
β_1=β_3 (p-value)	0.86	0.76	0.86	0.74	0.30
β_2=β_3 (p-value)	0.36	0.33	0.33	0.31	0.29
Personal Controls	No	Yes	Yes	Yes	Yes
Lottery Behavior Controls	No	No	Yes	Yes	Yes
Survey Controls	No	No	Yes	Yes	Yes
Change Life Satisfaction	No	No	No	No	Yes

Note: Based on 1142 observations; reference group: no ticket; **p<0.01; *p<0.05; #p<0.10; robust standard errors in parentheses

ticket report a significantly higher change in happiness score (Panel A), where there are no significant differences between players with only a free ticket, a free and purchased ticket, and only a purchased ticket (Panel B). Our results are robust to gradually including several groups of control variables, i.e. personal characteristics, lottery behavior variables and survey characteristics. Even when we control for the change in life satisfaction in the period between T_1 and T_2 – which can be considered a very conservative estimate of the lottery play effect – the effect of obtaining a lottery ticket on the change in happiness is positive and significant.

It can be argued that it is difficult to gain procedural utility from a lottery draw if one never thinks about the lottery. Hence, we re-estimated our models, using information from the survey shortly before the lottery draw. More specifically, we investigated whether the intensity of thinking about the lottery affects the change in happiness before the lottery draw, i.e. between T_1 and T_2. Here, we distinguish between three groups of lottery players: players that never thought about the lottery (answer category 1; 15% of the lottery players), players that sometimes thought about the lottery (answer category 2 to 3; 69% of the lottery players), and players that frequently thought about the lottery (answer category 4 or higher; 16%) using the following equation:

$$\Delta H_{12,i} = \alpha_2 + \gamma_1 LT_i I_{1,i} + \gamma_2 LT_i I_{2,i} + \gamma_3 LT_i I_{3,i} + \gamma_4 X_i + \gamma_5 \Delta S_{12,i} + \gamma_6 \Delta LS_i + \epsilon_{12,i} \quad (2)$$

Table 2: **Additional Parameter Estimates Change in Happiness between T_1 and T_2: Thinking about the Draw**

Lottery Ticket & Thoughts About Lottery						
No Thoughts (γ_1)	0.08 (0.17)	0.16 (0.16)	0.07 (0.14)	0.08 (0.17)	0.16 (0.16)	0.07 (0.14)
Thoughts ($\gamma_2 = \gamma_3 = \gamma_2^*$)	0.45 (0.13)**	0.41 (0.13)**	0.29 (0.12)*			
Thought Sometimes (γ_2)				0.41 (0.13)**	0.39 (0.13)**	0.27 (0.12)*
Thought Frequently (γ_3)				0.62 (0.15)**	0.52 (0.16)**	0.39 (0.14)**
R^2	0.02	0.08	0.20	0.02	0.08	0.20
$\gamma_1 = \gamma_2^*$ (p-value)	0.00	0.04	0.04			
$\gamma_1 = \gamma_2$ (p-value)				0.01	0.07	0.06
$\gamma_1 = \gamma_3$ (p-value)				0.00	0.02	0.02
$\gamma_2 = \gamma_3$ (p-value)				0.06	0.21	0.23
Personal Controls	No	Yes	Yes	No	Yes	Yes
Lottery Behavior Controls	No	Yes	Yes	No	Yes	Yes
Survey Controls	No	Yes	Yes	No	Yes	Yes
Change Life Satisfaction	No	No	Yes	No	No	Yes

Note: Based on 1142 observations; reference group: no ticket; **p<0.01; *p<0.05; #p<0.10; robust standard errors in parentheses

where α_2 represents a vector of interview date fixed effects, LT is a dummy variable indicating whether or not an individual had a lottery ticket irrespective of whether this was bought or received because of the field experiment and I_1 to I_3 are dummy variables indicating whether the individual had no thoughts about the lottery, sometimes thought about the lottery or frequently thought about the lottery. And, γ_1 to γ_6 are (vectors of) parameters.

The first column of Table 2 shows that players who never thought about the lottery did not experience a significantly higher increase in happiness than non-players. At the same time, players who thought about the lottery experienced higher increases in happiness than non-players and players who never thought about the lottery. As shown in the second and third columns, the difference remains significant if we include control variables and also the change in life satisfaction. The fourth to sixth column of Table 2 show that our results hold if we account for the intensity of thinking about the lottery draw. The change in happiness between T_1 and T_2 after receiving a lottery ticket is present if the individual thought about the lottery, but there is no statistically significant difference between players that thought about the lottery sometimes and players that thought about the lottery frequently. However, if we include control variables and also in addition include the change in life satisfaction the intensity of thoughts about the lottery

is irrelevant. The change in happiness between T_1 and T_2 after receiving a lottery ticket is present if the individual thought about the lottery, but it does not matter whether the individual thought about the lottery sometimes or frequently.

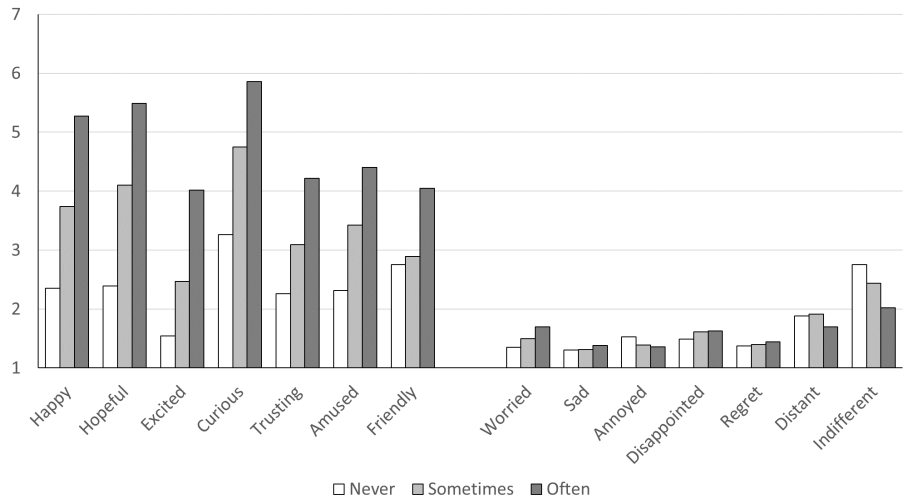
Along similar lines, it is difficult to gain procedural utility from a lottery draw if one does not have positive feelings when thinking about the lottery. Accordingly, we examined to what extent the procedural utility from a lottery draw is contingent on having overall positive emotions when thinking about the draw. In this regard, it is also interesting to note that participants thinking regularly about the draw, experience higher levels of positive emotions and not higher levels of negative emotions compared to participants thinking never or only sometimes about the draw (see Figure 1). We observe this across the whole range of positive emotions. In our regression, we investigate whether having positive emotions about the draw affects the change in happiness before the draw (again between T_1 and T_2), where we take the balance of positive to negative affect (PANA) score regarding the draw as main indicator for the positivity ratio when thinking about the draw.[10] We use the following equation:

$$\Delta H_{12,i} = \alpha_3 + \phi_1 LT_i + \phi_2 LT_i PN_{2,i} + \phi_3 X_i + \phi_4 \Delta S_{12,i} + \phi_5 \Delta LS_i + \nu_{12,i} \qquad (3)$$

where α_3 represents again a vector of interview date fixed effect and LT is a dummy variable indicating whether or not an individual had a lottery ticket irrespective of whether this was bought or received because of the field experiment, PN is a mean-centered continuous variable indicating a respondents' positivity ratio (PANA) regarding the draw. And, ϕ_1 to ϕ_5 are (vectors of) parameters. Our regression results are presented in Table 3. The first two columns show that players who had a higher positivity ratio regarding the draw experienced higher increases in happiness, where column 3-6 show that these results are primarily driven by the positive emotions. To exemplify, players that had no or hardly any positive emotions at all regarding the draw (maximum average score on the PA of 2 out of 7), did not experience an increase in happiness between T_1 and T_2 (p=0.086).

[10]The balance of positive to negative emotions is also known as the positivity ratio and estimated as the average positive affect (PA) score minus the negative affect (NA) score. An overview of the emotions included can be found in Figure 1 and the methodology section.

Figure 1: **Positive and negative emotions about participation in the State Lottery; experienced before the lottery draw by frequency of thinking about the draw**



Note: Only for respondents who possessed a lottery ticket for the lottery draw of May 10; average answers to questions on emotions on a scale from 1 (not at all) to 7 (completely)

Indirectly, the joy of lottery play could also be inferred from people's willingness to pay for a lottery ticket. In the survey at T_1, participants indicated their willingness to pay for a lottery ticket. In a thought experiment, participants made a choice between receiving a small sum of money or a lottery ticket with a retail price of €15. Although this can also indicate that people overestimate the expected value of a lottery ticket, many people choose to get the lottery ticket when the amount of money they would have received was larger than the retail price of the lottery ticket. Most notably, 43% of the

Table 3: **Additional Parameter Estimates Change in Happiness between T_1 and T_2: Emotions regarding the draw**

Lottery Ticket & PANA Score						
Lottery Ticket (ϕ_1)	0.40 (0.12)***	0.26 (0.11)**	0.40 (0.12)***	0.26 (0.11)**	0.40 (0.12)***	0.26 (0.11)**
Lottery Ticket * PANA Score (ϕ_2)	0.09 (0.03)***	0.07 (0.03)**				
Lottery Ticket * PA Score (ϕ_2)			0.12 (0.03)***	0.08 (0.03)**		
Lottery Ticket * NA Score (ϕ_2)					-0.02 (0.05)	-0.02 (0.05)
R^2	0.02	0.20	0.02	0.20	0.01	0.20
Personal Controls	No	Yes	No	Yes	No	Yes
Lottery Behavior Controls	No	Yes	No	Yes	No	Yes
Survey Controls	No	Yes	No	Yes	No	Yes
Change Life Satisfaction	No	Yes	No	Yes	No	Yes

Note: Based on 1142 observations; PANA = positivity ratio; PA (NA) = positive (negative) part of the positivity ratio; reference group: no ticket; Scores are mean-centered; **p<0.01; *p<0.05; #p<0.10; robust standard errors in parentheses

participants preferred the lottery ticket over receiving €17.50, while even 30% of the participants preferred the lottery ticket over receiving €25.[11]

4 Procedural Utility of Winning a Small Prize

We want to assess the happiness effect of winning a small lottery prize. For this, we related the change in happiness between surveys 1 and 3, $\Delta H_{13,i}$ to explanatory variables as follows:

$$\Delta H_{13,i} = \alpha_4 + (\delta_1 F_i + \delta_2 B_i + \delta_3 C_i)(1 - P_i) + (\delta_4 F_i + \delta_5 B_i + \delta_6 C_i) P_i + \delta_7 X_i + \delta_8 \Delta S_{12,i} + \delta_9 \Delta LS_i + \varepsilon_{13,i} \tag{4}$$

where α_4 represents a vector of interview date fixed effects, P_i is a dummy variable for whether or not the individual won a (small) prize and δ_1 to δ_9 are (vectors of) parameters.

In case of procedural utility after the draw, originating from winning a small prize, we expect that the change in happiness between T_1 and T_3 is significantly larger for lottery winners than for non-players. Furthermore, we expect that the change in happiness between T_1 and T_3 is significantly larger for lottery winners than for non-lottery winners. Finally, we expect that the change in happiness between T_1 and T_3 is not significantly larger for lottery winners with a free ticket than for lottery winners with a purchased ticket.

In the draw in which the participants of our experiment had a lottery ticket, 49% did not win a prize at all, 39% won less than 10 euro, 11% won a prize between 10 and 100 euro, and 1% won a prize larger than 100 euro. On average, we do not find evidence for procedural utility after the draw, originating from winning a small prize. Lottery winners did not experience a significantly larger change in happiness between T_1 and T_3 compared to non-players. Nevertheless, as shown in panel A of Table 4 there is a significant difference between those that had a lottery ticket and won a prize and those that had a lottery ticket and did not win a prize.

[11] This suggests that for these participants, the transaction costs of buying a lottery ticket were perceived to be more than €10, i.e. the difference between €25 and the price of a lottery ticket.At the same time, participants realized that the chances of winning were small. Our survey showed that well over 80% of the respondents that regularly played the lottery thought that the chance to win a large prize in the lottery is small to very small, while less than 5% thought that the chance was large to very large.

Panel B of Table 4 shows the parameter estimates if we also make a distinction between the ways through which the individual got a lottery ticket, i.e. purchased, free or both. Now we find that there is only a positive and significant effect for those with a small prize and a free ticket (Table 4), while at the same time the winners with a free ticket are significantly happier than winners with both free and purchased tickets. Clearly, these results are independent of whether or not we include control variables and the change in life satisfaction.

Table 4: **Parameter Estimates Change in Happiness between T_1 and T_3**

Panel A					
Lottery Ticket and No Prize ($\delta_1 = \delta_2 = \delta_3 = \delta_1^*$)	-0.10 (0.11)	-0.05 (0.11)	-0.04 (0.12)	-0.09 (0.11)	-0.15 (0.10)
Lottery Ticket and Prize ($\delta_4 = \delta_5 = \delta_6 = \delta_4^*$)	0.10 (0.11)	0.15 (0.11)	0.15 (0.11)	0.09 (0.11)	-0.02 (0.10)
R^2	0.01	0.02	0.02	0.06	0.34
$\delta_1^* = \delta_4^*$ (p-value)	0.02	0.02	0.02	0.03	0.02
Panel B					
Free ticket and No Prize (δ_1)	-0.15 (0.12)	-0.11 (0.12)	-0.11 (0.12)	-0.15 (0.12)	-0.19 (0.11)*
Purchased ticket and No Prize (δ_2)	-0.05 (0.23)	0.03 (0.25)	0.04 (0.25)	0.06 (0.26)	-0.03 (0.22)
Free and purchased ticket and No Prize (δ_3)	0.05 (0.14)	0.10 (0.14)	0.11 (0.14)	0.04 (0.14)	-0.07 (0.13)
Free ticket and Prize (δ_4)	0.22 (0.12)#	0.26 (0.12)*	0.25 (0.12)*	0.18 (0.12)*	0.10 (0.10)
Purchased ticket and Prize (δ_5)	0.04 (0.24)	0.08 (0.25)	0.10 (0.26)	0.08 (0.25)	-0.00 (0.24)
Free and purchased ticket and Prize (δ_6)	-0.10 (0.13)	-0.04 (0.14)	-0.03 (0.14)	-0.07 (0.15)	-0.13 (0.13)
R^2	0.01	0.03	0.03	0.06	0.34
$\delta_4 = \delta_5$ (p-value)	0.43	0.45	0.52	0.70	0.64
$\delta_4 = \delta_6$ (p-value)	0.00	0.01	0.02	0.04	0.04
$\delta_5 = \delta_6$ (p-value)	0.56	0.65	0.63	0.54	0.60
Personal Controls	No	Yes	Yes	Yes	Yes
Lottery Behavior Controls	No	No	Yes	Yes	Yes
Survey Controls	No	No	Yes	Yes	Yes
Change Life Satisfaction	No	No	No	No	Yes

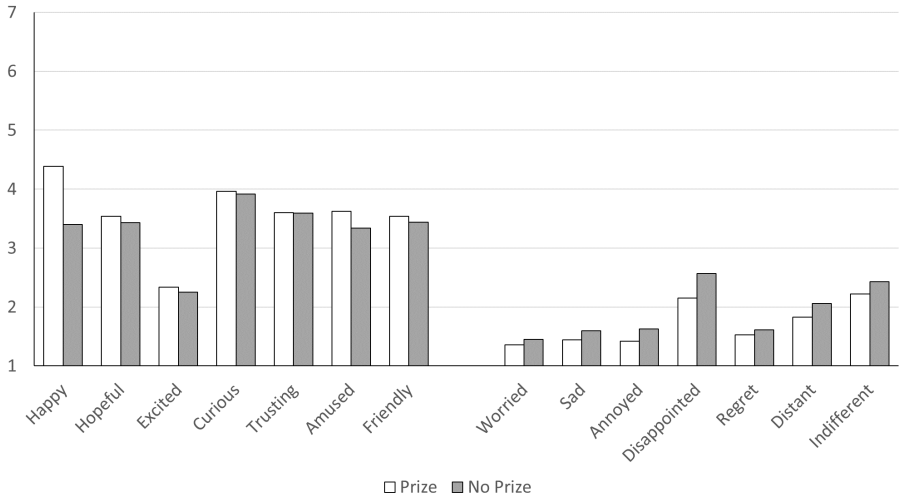
Note: Based on 1097 observations; reference group: no ticket; **p<0.01; *p<0.05; #p<0.10; robust standard errors in parentheses

We conclude from this that only a combination of not having purchased a lottery ticket and receiving one for free and winning a prize leads to an increase in happiness. Our findings are confirmed by a test in which participants (n=400) who did not see the results of the lottery draw had the opportunity to look up the results via a link in the survey to check whether they had won or not won a prize in the lottery. This opportunity was provided after the question asking how the participants felt today. At the end of the survey, participants were asked how happy they were feeling at this moment on a scale from 0 to 10. Respondents who viewed the link and won a prize were not significantly happier than respondents who viewed the link and did not win a prize (p=0.93). This result was found for people with a free ticket (p=0.87), purchased ticket (p=0.13), and

free and purchased ticket (p=0.49).

As a robustness check, we also examined differences in specific emotions after the draw. Again participants were asked which emotions they experienced when they thought back about participating in the draw of the State Lottery on May 10th. Although winners reported to be happier and less disappointed, winners and non-winners did only marginally differ regarding the other experienced emotions regarding the draw (see Figure 2). In a further analysis, we only found evidence for procedural utility for winners that were already positive about the lottery before the draw.[12] This fuels the idea that the procedural non-monetary utility derived from winning a (small) prize is rather limited.

Figure 2: **Emotions experienced after the draw by winners and non-winners**



Note: Only for respondents who possessed a lottery ticket for the lottery draw of May 10; average answers to questions on emotions on a scale from 1 (not at all) to 7 (completely)

5 Discussion and Conclusions

From a financial point of view buying a lottery ticket is not a rational investment as the average ex-post value of a ticket is just over half the price of that ticket. Nevertheless, many people participate in lotteries. There are various explanations for this ranging from low cost opportunities to improve one's financial position if there are few opportunities to do this otherwise to prospect theory according to which people overestimate the small probability of winning a lottery. Both explanations are not completely in line with current

[12]This analysis is available upon request.

empirical findings. The first explanation suggests that participation would be predominantly among lower social classes which is not the case since lottery play takes place across the whole income distribution. The second explanation is at odds with the finding that most lottery participants have quite accurate expectations about the probability to win a prize.

We studied lottery participation using a field experiment in which some participants of a regular household survey received a state lottery ticket for free, while other participants had no ticket or only a purchased ticket. This allows us to investigate to what extent participating in a lottery increases happiness. If so, this is support for a third explanation of lottery participation, i.e. people deriving non-monetary utility from participating in a lottery play. This could be because of the hope of winning a large prize, the fun and excitement of the game, or because of social bonding activities when playing the lottery together with family or friends.

In our field experiment, happiness is measured at three moments in time, i.e. before free lottery tickets are issued, after providing some individuals with a free lottery ticket but before the draw and after the draw. We study the change in happiness between the first two moments to investigate whether playing in the lottery increases happiness, regardless of whether the ticket was bought or free. We also study the change in happiness between the first and third moment to investigate to what extent winning a small lottery prize matters.

Our main finding is that participants in a lottery derive utility from playing the game. This is irrespective of whether the lottery ticket was bought or received for free due to the experiment. These results may be driven by the hope and expectations about financial gains, the thrill of a potential win, and social bonding when playing as a group. However, the procedural utility that players derive from winning a small prize is limited. In sum, we conclude that lottery participation seems to be at least partly driven by the joy of lottery play, i.e. lottery participants may be hoping for financial gains but gamble for fun. More generally, our research shows the importance of taking in procedural utility in modeling decisions of consumers since consumers do not only care about outcomes, but also about the process.

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Appendix A: Overview of control variables

- Personal characteristics
  - Female: Dummy variable indicating whether the respondent is female
  - Age: Age in years
  - Employed: Dummy variable indicating whether the respondent is working
  - Unemployed: Dummy variable indicating whether the respondent is unemployed
  - High household income: Dummy variable indicating whether the net monthly household income is over €2600
  - High education level: Dummy variable indicating whether respondent finished at least an study program at ISCED 5-6 level
  - High social economic status: Self-assessed status regarding salary, job and social status.
  - Partner: Dummy variable indicating whether the respondent has a partner
  - Children: Dummy variable indicating whether respondent has children
  - Urban environment and region: Dummy variables indicating level of urbanity of residence is at least high or very high; Dummy variable whether a respondent lives in the North, East, or South of the Netherlands (West is reference group)
- Personality characteristics
  - Materialism: Score on Richins's Material Values Scale (Richins (2004))
  - Optimism: Score on the Life Orientation Test - Revised (Scheier et al. (1994))
  - Internal locus of control: Score on Short version of the Levenson IPC scale (Sapp and Harrod (1993))
- Gambling behavior
  - Frequency of lottery participation: Dummy variable indicating that a respondent has at least participated in the lottery a few times in the last year
  - Won in past year: Dummy variable indicating the respondent has had a win in the lottery in the past year
  - Thinks chance of winning is high: Dummy variable indicating that the respondent assessed the chances of ever winning a large price is high (larger than a score of 3 on a seven-point scale)
- Perceived survey characteristics
  - Change in duration questionnaire: Difference in duration of questionnaire in minutes for the different time points.
  - Change in enjoyability questionnaire: Difference in enjoyability for the different time points. Based on the question: Did you enjoy filling out this questionnaire? (1=Not at all; 5=Very much).

  - Change in difficulty questionnaire: Difference in duration of questionnaire for the different time points. Based on the question: Did you find it difficult answering the questions in this questionnaire? (1=Not at all; 5=Very much).

- Change in life satisfaction: Change in life satisfaction score between two surveys. Based on the question: All things considered, how satisfied are you with your life-as-a-whole? (1=very dissatisfied; 10=very satisfied).

Table A1: Descriptive Statistics

	Tables 1–3 (N=1,142)			Table 4 (N=1,096)		
Variables	Mean	Min	Max	Mean	Min	Max
Change in Happiness (T_1-T_2)	-0.10	-7	6			
Change in Happiness (T_1-T_3)				-0.22	-7	6
Lottery Ticket	0.89	0	1			
Free Ticket	0.59	0	1			
Purchased Ticket	0.04	0	1			
Free and Purchased Ticket	0.26	0	1			
Thought About Lottery	0.76	0	1			
Thought Sometimes About Lottery	0.61	0	1			
Thought Frequently About Lottery	0.15	0	1			
Lottery Ticket and No Prize				0.44	0	1
Lottery Ticket and Prize				0.45	0	1
Free Ticket and No Prize				0.32	0	1
Purchased Ticket and No Prize				0.01	0	1
Free and Purchased Ticket and No Prize				0.11	0	1
Free Ticket and Prize				0.27	0	1
Purchased Ticket and Prize				0.02	0	1
Free and purchased Ticket and Prize				0.16	0	1
Female	0.47	0	1	0.47	0	1
Age	56.78	18	92	56.61	18	92
Employed	0.46	0	1	0.46	0	1
Unemployed	0.08	0	1	0.08	0	1
High Household Income	0.46	0	1	0.46	0	1
High Education Level	0.39	0	1	0.38	0	1
High Socio-Economic Status	0.21	0	1	0.21	0	1
Partner	0.69	0	1	0.68	0	1
Children	0.26	0	1	0.26	0	1
Urban Environment	0.40	0	1	0.40	0	1
Northern Netherlands	0.13	0	1	0.13	0	1
Eastern Netherlands	0.19	0	1	0.19	0	1
Southern Netherlands	0.25	0	1	0.25	0	1
Materialism	26.66	9	56	26.68	9	56
Optimism	29.25	9	42	29.27	9	42
Internal Locus of Control	45.59	25	63	45.61	25	62
Frequent Lottery Participation	0.64	0	1	0.64	0	1
Won in Past Year	0.02	0	1	0.02	0	1
Thinks Chance of Winning is High	0.17	0	1	0.17	0	1
Δ Duration Questionnaires T_1-T_2	-29.29	-5590.83	1486.93			
Δ Enjoyability Questionnaires T_1-T_2	0.07	-4	4			
Δ Difficulty Questionnaires T_1-T_2	-0.77	-4	4			
Δ Life Satisfaction T_1-T_2	-0.13	-9	6			
Δ Duration Questionnaires T_1-T_3				-18.76	-5589.87	2143.21
Δ Enjoyability Questionnaires T_1-T_3				0.08	-4	4
Δ Difficulty Questionnaires T_1-T_3				-0.81	-4	4
Δ Life Satisfaction T_1-T_3				-0.16	-9	6

Appendix B: Questionnaires – Not for publication

B1: Questionnaire at T_1

v1 Below, you can find ten different situations, where you are asked to choose between either one state lottery ticket (with a retail value of €15 and a Jackpot or 7,5 million euros) or a set sum of money. Please indicate whether you would prefer the lottery ticket or the money.

v1a Lottery ticket or €2.50
v1b Lottery ticket or €5.00
v1c Lottery ticket or €7.50
v1d Lottery ticket or €10.00
v1e Lottery ticket or €12.50
v1f Lottery ticket or €15.00
v1g Lottery ticket or €17.50
v1h Lottery ticket or €20.00
v1i Lottery ticket or €22.50
v1j Lottery ticket or €25.00

v2 How happy do you feel today? Scale 1 (very unhappy) to 10 (very happy)

v3 All things considered, how satisfied are you with your life as a whole? Scale 1 (very unsatisfied) to 10 (very satisfied)

v4a - v4g In which lotteries have you participated in the past year (April 2014 - April 2015)? Multiple answers possible.

v4a The Lotto
v4b The Postcode lottery
v4c The State lottery
v4d The Friends lottery
v4e The BankGiro Lottery
v4f Other lottery or lotteries
v4g I did not participate in any lottery: 0 = No, 1 = Yes

if v4g ≠ 1

v5 How regularly have you participated in a lottery in the past year (April 2014 - April 2015)? *If you participate in more than one lottery, sum up the total of all the lotteries you participated in.*

1 Weekly or multiple times a week
2 Monthly, but not weekly
3 Multiple times a year, but not monthly
4 Once a year or never

if v4g ≠ 1

v6 On average, how much do you spend on lottery-participation at a time?

1 Less than €10
2 €10 - €24,99
3 €25 - €49,99
4 €50 - €99,99

5 €100 - €499,99
6 €500 or more

if v4g ≠ 1
v7 In the past year (April 2015 - April 2015), have you earned back your costs for lottery-participation?
1 No, I made more than €100 loss
2 No, but I made less than €100 loss
3 I spent about as much as I won
4 Yes, but I made less than €100 profit
5 Yes, I made more than €100 profit

if v4g ≠ 1
v8a - v8h On a scale from 1 (not at all) to 7 (completely), to what extent do you experience lottery draws as:
v8a A chance to be rich
v8b A fun activity
v8c A hobby or pastime
v8d A means against boredom
v8e Entertaining
v8f A source of income
v8g Relaxing
v8h A social activity with family and friends

if v4g ≠ 1
v9 To what extent do you agree with the following statements: 'Even if I don't win anything, I enjoy participating in a lottery'. Scale 1 (completely disagree) to 7 (completely agree)

if v4g ≠ 1
v10 How often do you talk about lottery-participation with friends, family or acquaintances? Scale from 1 (never) to 7 (always)

v11 How large do you estimate the chance that you will ever win a big prize in a lottery? Scale from 1 (very small) to 7 (very big)

v12a - v12g In which of the following gambling games have you participated in the last year (April 2014 - April 2015)? Multiple answers possible.
Please note: this is excluding participation in lotteries
v12a Gambling in a casino
v12b Gambling on sporting matches
v12c Online gambling
v12d Gambling on a slot machine
v12e Playing cars (such as poker) for money
v12f Another gambling game
v12g I did not participate in any gambling games except for lotteries in the past year (April 2014 - April 2015); 0 = No, 1 = Yes

v13a - v13f On a scale from 1 (completely disagree) to 7 (completely agree), to what extent do you agree with the following statements:

v13a In uncertain times, I usually expect the best.
v13b If something can go wrong for me, it will.
v13c I am always optimistic about my future.
v13d I hardly ever expect things to go my way.
v13e I rarely count on good things happening to me.
v13f Overall, I expect more good things to happen to me than bad.

v14 On a scale from 1 (completely disagree) to 7 (completely agree), to what extent do you agree with the following statements: 'I am a person that is often lucky.'

v15a - v15i On a scale from 1 (completely disagree) to 7 (completely agree), to what extent do you agree with the following statements:
v15a I like to own things that impress other people.
v15b The things I own say a lot about how well I'm doing in life.
v15c I admire people who own expensive homes, cars, and clothes.
v15d I try to keep my life simple, as far as possessions are concerned.
v15e Buying things gives me a lot of pleasure.
v15f I like a lot of luxury in my life.
v15g My life would be better if I owned certain things I don't have.
v15h I wouldn't be any happier if I owned nicer things.
v15i It sometimes bothers me quite a bit that I can't afford to buy all the things I'd like.

v16a - v16i On a scale from 1 (completely disagree) to 7 (completely agree), to what extent do you agree with the following statements:
v16a My life is determined by my own actions.
v16b I am usually able to protect my personal interests.
v16c I can pretty much determine what will happen in my life.
v16d To a great extent, my life is controlled by accidental happenings.
v16e Often there is no chance of protecting my personal interests from bad luck happenings.
v16f When I get what I want, it's usually because I'm lucky.
v16g People like myself have very little chance of protecting our personal interests where they conflict with those of strong pressure groups.
v16h My life is chiefly controlled by powerful others.
v16i I feel like what happens in my life is mostly determined by powerful people.

B2: Questionnaire at T_2

v1 On a scale from 1 (extremely unhappy) to 10 (extremely happy), how happy do you feel today?

v2 On a scale from 1 (very unsatisfied) to 10 (very satisfied), all things considered, how satisfied are you with your life-as-a-whole?

if respondents received a ticket from the State Lottery
v3 Recently, you have received a ticket for the State Lottery for the drawing of 10 may. On a scale from 1 (not happy at all) to 7 (very happy), how happy are you with this ticket?

if respondents did not receive a ticket from the State Lottery
v4 On May 10^{th} there is a draw of the State Lottery. Do you have a tickets for this draw, or do you intend to purchase a ticket for this draw?

1 No
2 Yes, I have a tickets
3 Yes, I am going to buy a ticket

if people received a ticket from the State lottery or if v4>1
v5a - v5h On a scale from 1 (not at all) to 7 (completely), to what extent do you perceive the oncoming draw of the State Lottery as:

v5a A chance to be rich
v5b A fun activity
v5c A hobby or pastime
v5d A means against boredom
v5e Entertaining
v5f A source of income
v5g Relaxing
v5h A social activity with family and friends

if people received a ticket from the State lottery or if v4>1
v6 On a scale from 1 (never) to 7 (always), how often do you think about the draw of the State Lottery?

if people received a ticket from the State lottery or if v4>1
v7 On a scale from 1 (not at all) to 7 (completely), which emotions do you experience when you think about the upcoming draw of the State Lottery? When I think about my participation in the State Lottery...

v7a I'm happy
v7b I'm worried
v7c I'm hopeful
v7d I'm sad
v7e I'm annoyed
v7f I'm excited
v7g I'm curious
v7h I'm disappointed
v7i I feel trusting
v7j I feel regret
v7k I feel amused
v7l I feel friendly
v7m I feel distant
v7n I feel indifferent

v8 On a scale from 1 (very small) to 7 (very large), how large do you estimate the chance that you will ever win a big price in a lottery?

v9 On a scale from 1 (completely disagree) to 7 (completely agree), to what extent do you agree with the following statements: 'I am a person that is often lucky'

B3: Questionnaire at T_3

v1 On a scale from 1 (very unhappy) to 10 (very happy), how happy do you feel today?

v2 On a scale from 1 (very dissatisfied) to 10 (very satisfied), all things considered, how satisfied are you with your life-as-a-whole?

if people received a ticket from the State lottery
v3 Recently, you have received a ticket for the State Lottery for the drawing of 10 may. On a scale from 1 (not happy at all) to 7 (very happy), how happy are you with this ticket?

if people received a ticket from the State lottery
v4 Have you, apart from the lottery ticket you received, participated with another ticket in the draw of the State Lottery of May 10^{th}?
1 No
2 No, but someone else in my household has
3 Yes

if people indicated to buy or bought a ticket from the State lottery at T2
v5 Have you participated in a lottery in the past week?
1. No
2. Yes, I already bought a ticket
3. Yes, I will buy a ticket

v6dag - v6uit On May 10^{th} 2015 there was a draw of the State Lottery. You had a ticket for this draw. When did you read the results?

If you haven't done it yet, we ask you to check the results now (on 'www.staatsloterij.nl/trekkingsuitslag') before proceeding with the following questions.

Fill out a day and a time. If you don't remember exactly, please give your best estimate. (For example: Monday 9:30)
v6dag Day
v6tijd Time
v6link I have just checked the results using the link; 0 = No, 1 = Yes
v6uit I don't want to know the results; 0 = No, 1 = Yes

if people received a ticket from the State lottery or if v5=2
v7a - v7n What emotions do you experience when you think back to you participation in the draw of the State Lottery of May 10^{th}? On a scale from 1 (not at all) to 7 (completely), when I think about my participation in the State Lottery...
v7a I'm happy
v7b I'm worried
v7c I'm hopeful
v7d I'm sad
v7e I'm annoyed
v7f I'm excited
v7g I'm curious
v7h I'm disappointed
v7i I feel trusting

v7j I feel regret
v7k I feel amused
v7l I feel friendly
v7m I feel distant
v7n I feel indifferent

if (staatslot=1 or v5=2) and if people do not want to know the results (v6)
v8 Did you win anything with your ticket for the State Lottery?
1 No
2 Yes, less than €10
3 Yes, €10 - €49,99
4 Yes, €50 - €99,99
5 Yes, €100 - €499,99
6 Yes, €500 or more

if (staatslot=1 or v5=2) and if people do not want to know the results (v6)
v9a - v9e Did you tell others whether you won anything in the State Lottery?
Multiple answers possible
v9a No
v9b Yes, friends
v9c Yes, partner or children
v9d Yes, other family members
v9e Yes, to others

if staatslot=1 or v5=2
v10 On a scale from 1 (never) to 7 (all the time), how often did you think about the draw of the lottery before the actual draw?

v11 On a scale from 1 (very small) to 7 (very large), how large do you estimate the chance that you will ever win a big price in a lottery?

v12 On a scale from 1 (completely disagree) to 7 (completely agree), to what extent do you agree with the following statement: 'I am a person that is often lucky'

v13 On a scale from 1 (very unhappy) to 10 (very happy), how happy do you feel at the moment?

Appendix C: Full estimates – not for publication

Appendix C1: Full Estimation Table 1 – Panel A

Lottery Ticket	0.40***	0.41***	0.40***	0.37***	0.25**
	(0.12)	(0.12)	(0.13)	(0.13)	(0.11)
Female		-0.11	-0.12	-0.15**	-0.16**
		(0.08)	(0.08)	(0.08)	(0.07)
Age		-0.00	-0.01	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)
Employed		0.08	0.06	0.05	-0.00
		(0.10)	(0.10)	(0.10)	(0.09)
Unemployed		0.28*	0.27*	0.29*	0.19
		(0.15)	(0.15)	(0.15)	(0.14)
High Household Income		0.10	0.09	0.08	0.04
		(0.08)	(0.08)	(0.08)	(0.08)
High Education Level		0.03	0.04	0.01	0.03
		(0.09)	(0.09)	(0.09)	(0.08)
High Socio-Economic Status		0.02	0.02	0.01	-0.01
		(0.10)	(0.10)	(0.10)	(0.09)
Partner		0.00	0.00	0.02	0.01
		(0.09)	(0.09)	(0.09)	(0.08)
Children		-0.02	-0.02	-0.06	-0.09
		(0.10)	(0.11)	(0.11)	(0.10)
Urban Environment		-0.07	-0.08	-0.07	-0.07
		(0.08)	(0.08)	(0.08)	(0.08)
Northern Netherlands		-0.15	-0.15	-0.19	-0.06
		(0.12)	(0.12)	(0.12)	(0.11)
Eastern Netherlands		-0.04	-0.05	-0.08	-0.06
		(0.10)	(0.10)	(0.10)	(0.10)
Southern Netherlands		-0.12	-0.12	-0.13	-0.12
		(0.10)	(0.10)	(0.10)	(0.09)
Materialism		0.01*	0.01*	0.01	0.01*
		(0.01)	(0.01)	(0.01)	(0.00)
Optimism		-0.01	-0.01	-0.01	-0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Internal Locus of Control		0.00	0.00	0.01	0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Frequent Lottery Participation			0.10	0.09	0.15*
			(0.09)	(0.09)	(0.08)
Won in Past Year			0.27	0.34	0.21
			(0.29)	(0.28)	(0.30)
Thinks Chance of Winning is High			0.04	0.01	0.02
			(0.09)	(0.09)	(0.08)
Difference in Duration Questionnaires T1-T2				0.00	0.00*
				(0.00)	(0.00)
Difference in Enjoyability Questionnaires T1-T2				0.10**	0.07
				(0.05)	(0.04)
Difference in Difficulty Questionnaires T1-T2				-0.05	-0.05*
				(0.03)	(0.03)
Difference in Life Satisfaction T1-T2					0.48***
					(0.05)
Constant	-0.46***	-0.21	-0.21	-0.57	-0.49
	(0.12)	(0.52)	(0.52)	(0.53)	(0.48)
Date dumies	NO	NO	NO	YES	YES
R^2	0.01	0.04	0.04	0.07	0.20

1,142 observations. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix C2: Full Estimation Table 1 – Panel B

Free Ticket	0.38***	0.40***	0.40***	0.37***	0.26**
	(0.13)	(0.13)	(0.13)	(0.13)	(0.12)
Purchased Ticket	0.56***	0.61***	0.57***	0.52**	0.39*
	(0.20)	(0.21)	(0.22)	(0.21)	(0.21)
Free and Purchased Ticket	0.40***	0.42***	0.38***	0.34**	0.19
	(0.13)	(0.14)	(0.14)	(0.14)	(0.13)
Female		-0.11	-0.12	-0.15**	-0.16**
		(0.08)	(0.08)	(0.08)	(0.07)
Age		-0.01	-0.01	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)
Employed		0.08	0.06	0.06	-0.00
		(0.10)	(0.10)	(0.10)	(0.09)
Unemployed		0.28*	0.27*	0.29*	0.18
		(0.15)	(0.15)	(0.15)	(0.14)
High Household Income		0.10	0.08	0.08	0.04
		(0.08)	(0.08)	(0.08)	(0.08)
High Education Level		0.04	0.04	0.01	0.03
		(0.09)	(0.09)	(0.09)	(0.08)
High Socio-Economic Status		0.02	0.02	0.01	-0.02
		(0.10)	(0.10)	(0.10)	(0.10)
Partner		-0.00	0.00	0.02	0.01
		(0.09)	(0.09)	(0.09)	(0.08)
Children		-0.01	-0.02	-0.06	-0.09
		(0.10)	(0.11)	(0.11)	(0.10)
Urban Environment		-0.08	-0.08	-0.07	-0.07
		(0.08)	(0.08)	(0.08)	(0.08)
Northern Netherlands		-0.15	-0.15	-0.19	-0.06
		(0.12)	(0.12)	(0.12)	(0.11)
Eastern Netherlands		-0.04	-0.05	-0.08	-0.06
		(0.10)	(0.10)	(0.10)	(0.10)
Southern Netherlands		-0.12	-0.12	-0.13	-0.13
		(0.10)	(0.10)	(0.10)	(0.09)
Materialism		0.01*	0.01*	0.01	0.01*
		(0.01)	(0.01)	(0.01)	(0.00)
Optimism		-0.01	-0.01	-0.01	-0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Internal Locus of Control		0.00	0.00	0.01	0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Frequent Lottery Participation			0.09	0.09	0.17**
			(0.09)	(0.09)	(0.08)
Won in Past Year			0.28	0.34	0.20
			(0.29)	(0.28)	(0.30)
Thinks Chance of Winning is High			0.04	0.01	0.03
			(0.09)	(0.09)	(0.08)
Difference in Duration Questionnaires T1-T2				0.00	0.00*
				(0.00)	(0.00)
Difference in Enjoyability Questionnaires T1-T2				0.10**	0.07*
				(0.05)	(0.04)
Difference in Difficulty Questionnaires T1-T2				-0.05	-0.05*
				(0.03)	(0.03)
Difference in Life Satisfaction T1-T2					0.48***
					(0.05)
Constant	-0.46***	-0.17	-0.19	-0.56	-0.49
	(0.12)	(0.52)	(0.52)	(0.53)	(0.48)
Date Dummies	NO	NO	NO	YES	YES
R^2	0.01	0.04	0.04	0.07	0.20

1,142 observations. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1

Appendix C3: Full Estimation Table 2

Ticket#No Thoughts About Lottery	0.08	0.16	0.07	0.08	0.16	0.07
	(0.17)	(0.16)	(0.14)	(0.17)	(0.16)	(0.14)
Lottery Ticket#Thought About Lottery	0.45***	0.41***	0.29**			
	(0.13)	(0.13)	(0.12)			
Ticket#Thought Sometimes About Lottery				0.41***	0.39***	0.27**
				(0.13)	(0.13)	(0.12)
Ticket#Thought Frequently About Lottery				0.62***	0.52***	0.39***
				(0.15)	(0.16)	(0.14)
		(0.08)	(0.07)		(0.08)	(0.07)
Age		-0.00	-0.00		-0.00	-0.00
		(0.00)	(0.00)		(0.00)	(0.00)
Employed		0.06	0.01		0.07	0.01
		(0.10)	(0.09)		(0.10)	(0.09)
Unemployed		0.31**	0.21		0.31**	0.21
		(0.15)	(0.14)		(0.15)	(0.14)
High Household Income		0.09	0.05		0.09	0.05
		(0.08)	(0.08)		(0.08)	(0.08)
High Educaiton Level		0.01	0.03		0.01	0.03
		(0.09)	(0.08)		(0.09)	(0.08)
High Socio-Economic Status		0.02	-0.01		0.02	-0.00
		(0.10)	(0.10)		(0.10)	(0.10)
Partner		0.02	0.01		0.02	0.01
		(0.09)	(0.08)		(0.09)	(0.08)
Children		-0.05	-0.09		-0.05	-0.09
		(0.11)	(0.10)		(0.11)	(0.10)
Urban Environment		-0.06	-0.06		-0.06	-0.06
		(0.08)	(0.08)		(0.08)	(0.08)
Northern Netherlands		-0.18	-0.05		-0.18	-0.05
		(0.12)	(0.11)		(0.12)	(0.11)
Eastern Netherlands		-0.08	-0.06		-0.08	-0.06
		(0.10)	(0.10)		(0.10)	(0.10)
Southern Netherlands		-0.13	-0.13		-0.13	-0.12
		(0.10)	(0.09)		(0.10)	(0.09)
Materialism		0.01	0.01		0.00	0.01
		(0.01)	(0.00)		(0.01)	(0.00)
Optimism		-0.02	-0.01		-0.02	-0.01
		(0.01)	(0.01)		(0.01)	(0.01)
Internal Locus of Control		0.01	0.01		0.01	0.01
		(0.01)	(0.01)		(0.01)	(0.01)
Frequent Lottery Participation		0.05	0.12		0.05	0.12
		(0.09)	(0.08)		(0.09)	(0.08)
Won in Past Year		0.36	0.23		0.35	0.22
		(0.28)	(0.30)		(0.28)	(0.30)
Thinks Chance of Winning is High		-0.00	0.02		-0.01	0.01
		(0.09)	(0.08)		(0.09)	(0.08)
Difference in Duration Questionnaires T1-T2		0.00	0.00*		0.00	0.00*
		(0.00)	(0.00)		(0.00)	(0.00)
Difference in Enjoyability Questionnaires T1-T2		0.09*	0.06		0.08*	0.05
		(0.05)	(0.04)		(0.05)	(0.04)
Difference in Difficulty Questionnaires T1-T2		-0.05	-0.05*		-0.04	-0.05
		(0.03)	(0.03)		(0.03)	(0.03)
Difference in Life Satisfaction T1-T2			0.48***			0.48***
			(0.05)			(0.05)
Constant	-0.46***	-0.27	-0.27	-0.46***	-0.25	-0.25
	(0.12)	(0.52)	(0.47)	(0.12)	(0.52)	(0.47)
Date Dumies	NO	YES	YES	NO	YES	YES
R^2	0.02	0.08	0.20	0.02	0.08	0.20
1,140 observations. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1						

Appendix C4: Full Estimation Table 3

Lottery Ticket	0.40***	0.26**	0.40***	0.26**	0.40***	0.26**
	(0.12)	(0.11)	(0.12)	(0.11)	(0.13)	(0.11)
Lottery Ticket * PANA score (mean-centered)	0.09***	0.07**				
	(0.03)	(0.03)				
Lottery Ticket * PA score (mean-centered)			0.12***	0.08**		
			(0.03)	(0.03)		
Lottery Ticket * NA score (mean-centered)					-0.02	-0.02
					(0.05)	(0.05)
Female		-0.18**		-0.18**		-0.16**
		(0.07)		(0.07)		(0.07)
Age		-0.00		-0.00		-0.00
		(0.00)		(0.00)		(0.00)
Employed		0.00		0.01		-0.00
		(0.09)		(0.09)		(0.09)
Unemployed		0.19		0.20		0.19
		(0.14)		(0.14)		(0.14)
High Household Income		0.04		0.05		0.04
		(0.08)		(0.08)		(0.08)
High Education Level		0.04		0.04		0.03
		(0.08)		(0.08)		(0.08)
High Socio-Economic Status		0.01		0.00		-0.01
		(0.10)		(0.09)		(0.10)
Partner		0.01		0.01		0.01
		(0.08)		(0.08)		(0.08)
Children		-0.08		-0.08		-0.09
		(0.10)		(0.10)		(0.10)
Urban Environment		-0.07		-0.07		-0.07
		(0.08)		(0.08)		(0.08)
Northern Netherlands		-0.06		-0.05		-0.06
		(0.11)		(0.11)		(0.11)
Eastern Netherlands		-0.06		-0.05		-0.06
		(0.10)		(0.10)		(0.10)
Southern Netherlands		-0.13		-0.12		-0.12
		(0.09)		(0.09)		(0.09)
Materialism		0.01		0.01		0.01*
		(0.00)		(0.01)		(0.00)
Optimism		-0.01		-0.01		-0.01
		(0.01)		(0.01)		(0.01)
Internal Locus of Control		0.01		0.01		0.00
		(0.01)		(0.01)		(0.01)
Frequent Lottery Participation		0.12		0.12		0.15*
		(0.08)		(0.08)		(0.08)
Won in Past Year		0.20		0.20		0.21
		(0.30)		(0.30)		(0.30)
Thinks Chance of Winning is High		0.01		0.00		0.03
		(0.08)		(0.08)		(0.08)
Difference in Duration Questionnaires T1-T2		0.00		0.00		0.00*
		(0.00)		(0.00)		(0.00)
Difference in Enjoyability Questionnaires T1-T2		0.04		0.05		0.07
		(0.04)		(0.04)		(0.04)
Difference in Difficulty Questionnaires T1-T2		-0.05*		-0.05*		-0.05*
		(0.03)		(0.03)		(0.03)
Difference in Life Satisfaction T1-T2		0.48***		0.48***		0.48***
		(0.05)		(0.05)		(0.05)
Constant	-0.46***	-0.15	-0.46***	-0.21	-0.46***	-0.25
	(0.12)	(0.47)	(0.12)	(0.47)	(0.12)	(0.48)
Date dummies	NO	YES	NO	YES	NO	YES
R^2	0.02	0.20	0.02	0.20	0.01	0.20
1,140 observations. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1						

Appendix C5: Full Estimation Table 4 – Panel A

Lottery Ticket and No Prize	-0.10	-0.05	-0.04	-0.09	-0.15
	(0.11)	(0.11)	(0.12)	(0.11)	(0.10)
Lottery Ticket and Prize	0.10	0.15	0.15	0.09	0.02
	(0.11)	(0.11)	(0.11)	(0.11)	(0.10)
Female		-0.14*	-0.14*	-0.17**	-0.17**
		(0.08)	(0.08)	(0.08)	(0.08)
Age		-0.01	-0.01	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)
Employed		-0.12	-0.12	-0.10	-0.10
		(0.10)	(0.10)	(0.10)	(0.10)
Unemployed		0.05	0.05	0.09	0.09
		(0.15)	(0.15)	(0.15)	(0.14)
High Household Income		0.07	0.08	0.06	-0.01
		(0.09)	(0.09)	(0.09)	(0.08)
High Education Level		0.07	0.06	0.06	0.11
		(0.09)	(0.09)	(0.09)	(0.08)
High Socio-Economic Status		0.13	0.12	0.12	0.05
		(0.10)	(0.10)	(0.10)	(0.09)
Partner		-0.07	-0.07	-0.06	-0.05
		(0.10)	(0.10)	(0.09)	(0.09)
Children		-0.01	-0.02	-0.06	-0.09
		(0.11)	(0.11)	(0.11)	(0.10)
Urban Environment		-0.03	-0.03	-0.00	-0.00
		(0.08)	(0.08)	(0.08)	(0.08)
Northern Netherlands		-0.10	-0.10	-0.08	0.02
		(0.12)	(0.12)	(0.12)	(0.11)
Eastern Netherlands		0.09	0.08	0.08	0.11
		(0.11)	(0.11)	(0.11)	(0.10)
Southern Netherlands		-0.09	-0.09	-0.07	-0.04
		(0.10)	(0.10)	(0.10)	(0.09)
Materialism		-0.00	0.00	-0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.00)
Optimism		-0.01	-0.01	-0.01	-0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Internal Locus Control		-0.00	0.00	0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Frequent Lottery Participation			-0.04	-0.03	0.02
			(0.09)	(0.09)	(0.08)
Won in Past Year			0.37	0.35	0.23
			(0.25)	(0.26)	(0.27)
Thinks Chance Winning High			0.00	-0.06	-0.03
			(0.09)	(0.09)	(0.09)
Difference in Duration Questionnaires T1-T3				0.00	0.00
				(0.00)	(0.00)
Difference in Enjoyability Questionnaires T1-T3				0.15***	0.11**
				(0.06)	(0.06)
Difference in Difficulty Questionnaires T1-T3				-0.05	-0.06*
				(0.04)	(0.03)
Difference in Life Satisfaction T1-T3					0.50***
					(0.05)
Constant	-0.24**	0.59	0.56	0.38	-0.02
	(0.10)	(0.50)	(0.50)	(0.50)	(0.46)
Date Dummies	NO	NO	NO	YES	YES
R^2	0.01	0.02	0.02	0.06	0.18
Robust standard errors in parentheses; *** p¡0.01, ** p¡0.05, * p¡0.1					

Appendix C6: Full Estimation Table 4 – Panel B

Free Ticket and No Prize	-0.15	-0.11	-0.11	-0.15	-0.19*
	(0.12)	(0.12)	(0.12)	(0.12)	(0.11)
Purchased Ticket and No Prize	-0.05	0.04	0.05	0.06	-0.03
	(0.23)	(0.25)	(0.25)	(0.26)	(0.22)
Free and Purchased Ticket and No Prize	0.05	0.10	0.11	0.04	-0.08
	(0.14)	(0.14)	(0.14)	(0.14)	(0.13)
Free Ticket and Prize	0.22*	0.25**	0.25**	0.17	0.10
	(0.12)	(0.12)	(0.12)	(0.12)	(0.10)
Purchased Ticket and Prize	0.04	0.08	0.10	0.08	-0.00
	(0.24)	(0.25)	(0.26)	(0.25)	(0.24)
Free and Purchased Ticket and Prize	-0.10	-0.04	-0.03	-0.07	-0.14
	(0.13)	(0.14)	(0.14)	(0.15)	(0.13)
Female		-0.13*	-0.13	-0.16**	-0.16**
		(0.08)	(0.08)	(0.08)	(0.08)
Age		-0.01	-0.01	-0.00	-0.00
		(0.00)	(0.00)	(0.00)	(0.00)
Employed		-0.11	-0.11	-0.10	-0.10
		(0.10)	(0.10)	(0.10)	(0.10)
Unemployed		0.02	0.03	0.07	0.07
		(0.15)	(0.15)	(0.15)	(0.14)
High Household Income		0.07	0.07	0.06	-0.01
		(0.09)	(0.09)	(0.09)	(0.08)
High Education Level		0.06	0.06	0.05	0.10
		(0.09)	(0.09)	(0.09)	(0.08)
High Socio-Economic Status		0.14	0.13	0.13	0.06
		(0.10)	(0.10)	(0.10)	(0.09)
Partner		-0.07	-0.07	-0.05	-0.04
		(0.10)	(0.10)	(0.09)	(0.09)
Children		-0.01	-0.02	-0.06	-0.09
		(0.11)	(0.11)	(0.11)	(0.10)
Urban Environment		-0.02	-0.03	0.00	-0.00
		(0.09)	(0.08)	(0.08)	(0.08)
Northern Netherlands		-0.09	-0.10	-0.08	0.02
		(0.12)	(0.12)	(0.12)	(0.11)
Eastern Netherlands		0.10	0.09	0.09	0.12
		(0.11)	(0.11)	(0.11)	(0.10)
Southern Netherlands		-0.08	-0.08	-0.07	-0.04
		(0.10)	(0.10)	(0.10)	(0.09)
Materialism		-0.00	0.00	-0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.00)
Optimism		-0.01	-0.01	-0.01	-0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Internal Locus of Control		0.00	0.00	0.00	0.00
		(0.01)	(0.01)	(0.01)	(0.01)
Frequent Lottery Participation			-0.02	-0.01	0.04
			(0.09)	(0.09)	(0.09)
Won in Past Year			0.35	0.34	0.21
			(0.25)	(0.26)	(0.27)
Thinks Chance of Winning is High			-0.00	-0.05	-0.03
			(0.09)	(0.09)	(0.09)
Difference in Duration Questionnaires T1-T3				0.00	0.00
				(0.00)	(0.00)
Difference in Enjoyability Questionnaires T1-T3				0.15**	0.11**
				(0.06)	(0.06)
Difference in Difficulty Questionnaires T1-T3				-0.04	-0.05*
				(0.04)	(0.03)
Difference in Life Satisfaction T1-T3					0.49***
					(0.05)
Constant	-0.24**	0.49	0.47	0.31	0.12
	(0.10)	(0.50)	(0.51)	(0.50)	(0.46)
Date Dummies	NO	NO	NO	YES	YES
R^2	0.01	0.03	0.03	0.06	0.18
1,097 observations. Robust standard errors in parentheses; *** p<0.01, ** p<0.05, * p<0.1					