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# Do MTurkers Exhibit Myopic Loss Aversion?\*

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#### Abstract

We present results from a highly powered online experiment with 937 participants on Amazon Mechanical Turk (MTurk) that examined whether MTurkers exhibit myopic loss aversion (MLA). The experiment consisted of measuring MLA-compliant behavior in two between-subjects treatments that differed only regarding the risk profile of the risky asset employed. We found no statistically significant evidence of MLA-compliant behavior among MTurkers in both treatments.

JEL classification: G10 G11 G41

Keywords: online experiment, myopic loss aversion, risk, mturk

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## 1 Introduction

The concept of myopic loss aversion (MLA) has originally been introduced by Benartzi and Thaler (1995) as a possible explanation for the equity premium puzzle (Mehra and Prescott, 1985). MLA describes the behavior of individuals to frame decisions narrowly, i.e., to evaluate investments frequently or to segregate them, which is based on mental accounting (Kahneman and Tversky, 1984; Thaler, 1985; Kahneman and Lovallo, 1993; Thaler et al., 1997; Lee and Veld-Merkoulova, 2016), making them more prone to existing loss aversion (Kahneman and Tversky, 1979). Such behavior has been associated with a negative impact on individuals' financial decision making (Looney and Hardin, 2009). There exists a substantial body of empirical evidence supporting the theory of MLA. In particular, MLA-compliant behavior has been shown among university students in individual decisions (Keren and Wagenaar, 1987; Gneezy and Potters, 1997; Thaler et al., 1997; Bellemare et al., 2005; Langer and Weber, 2005; Fellner and Sutter, 2009) and in experimental market situations (Gneezy et al., 2003). In addition, Sutter (2007) has shown that teams of students as decision makers display MLA. It has further been demonstrated that not only students, but also individuals from the general population (Van der Heijden et al., 2012), financial experts (Haigh and List, 2005; Eriksen and Kvaloy, 2010; Larson et al., 2012), and private investors (Wendy and Asri, 2012) behave in accordance with MLA theory. Furthermore, there exists evidence for MLA-compliant behavior in the contexts of retirement savings and insurances (Benartzi and Thaler, 1999; Papon, 2008).

We conducted an online experiment to investigate whether the concept of MLA can be generalized to the behavior of crowd workers on Amazon Mechanical Turk (MTurk), a subject pool that is frequently recruited for social science online experiments (Chandler and Shapiro, 2016). In doing so, we implemented the lottery investment framework established by Gneezy and Potters (1997) – the foundation for the most frequently applied measurement of MLA available (see e.g., Bellemare et al., 2005; Haigh and List, 2005; Fellner and Sutter, 2009) – on MTurk. Crowd workers on Mturk have been shown to produce results similar to those in laboratory experiments (Paolacci et al., 2010; Crump et al., 2013) and to reliably and consistently report characteristics such as demographics and risk preferences that have been found to correlate with actual risk-taking in simple lottery experiments (Johnson and Ryan, 2020).

Given that the predictions of MLA theory do not explicitly differ between various types of mixed gambles as long as they are characterized by a positive expected value (Haisley et al., 2008), as an exploratory extension we also tested whether design changes regarding the risk profile of the lottery affect participant behavior. For this reason, in addition to the lottery by Gneezy and Potters (1997), we applied a second lottery based on Charness and Gneezy (2010), which is also characterized by a positive expected value, however, this lottery is more attractive in terms of both the expected value and the probabilities of gaining and loosing.<sup>1</sup>

We did not find evidence of behavior consistent with MLA in MTurkers in either treatment. Thus, we provide results that question the generalizability of the concept of MLA across groups of people. In addition, we found no difference-in-difference effect between the two treatments, suggesting that the differences in the risk profiles do not statistically significantly affect the impact of varying feedback and decision frequency on participants' risk-taking. Finally, on a more general level, we found higher overall risk-taking for the more attractive lottery.

<sup>&</sup>lt;sup>1</sup>This choice was motivated by the fact that a pretest of a previous study by the authors (Hueber and Schwaiger, 2021), in which this lottery was used in a MLA framework, revealed behavior in student participants that was exactly opposed to the behavior predicted by MLA. Although the number of participants in this pre-test was very small, such reverse behavior did not occur in a similarly powered pre-test applying the lottery by Gneezy and Potters (1997).

With this study, we contribute mainly to two strands in the literature. We contribute to the general literature on MLA already discussed. Specifically, we add by applying the Gneezy and Potters (1997) MLA framework to MTurker's, i.e., a pool of subjects that, to the best of our knowledge, has not yet been investigated in this respect. In doing so, we test the external validity of MLA and, in particular, the systematic generalizability of the concept across groups of people. Secondly, by testing MLA based on lotteries with different risk profiles, we contribute to a smaller part of the literature that examines the robustness and universality of MLA with respect to differences in the characteristics of the underlying risky asset. Beshears et al. (2017) have shown that the behavioral prediction of MLA theory does not necessarily remain accurate once more realistic parameters of risky assets are used, such as actual financial market data. Haisley et al. (2008) have provided evidence that for mixed gambles with negative expected value, such as state lotteries, broad bracketing, i.e., aggregating the outcomes of multiple games, does not increase risk-taking, but decreases it. However, this is consistent with the notion of MLA implying better outcomes when decisions are considered in a broader frame. Similar results, but when considering lotteries with positive expected value, have been obtained by Langer and Weber (2001, 2005). The authors have provided a compelling argument to extend the concept of MLA to the concept of myopic prospect theory (MPT) to also explain non-unidirectional effects of varying feedback and decision frequency on decisions under risk with positive expected value. In addition, studies that have looked at the causes of MLA-conforming behavior, i.e., feedback and/or decision frequency, have provided mixed results (Bellemare et al., 2005; Langer and Weber, 2008; Fellner and Sutter, 2009). As Zeisberger et al. (2012, p. 46) have aptly put it: "What can be learned from the large body of research on myopia and investment is that there is obviously considerable heterogeneity in individual behavior and minor design issues that had not been considered to be relevant beforehand might have a major impact on the results." In particular, we contribute to this strand by measuring MLA-compliant behavior across decision situations by implementing two mixed gambles based on Gneezy and Potters (1997) and Charness and Gneezy (2010) on MTurk that differ in attractiveness in terms of win and loss probabilities and expected values.

### 2 Experimental Design and Procedure

Following the procedure by Gneezy and Potters (1997), the participants had to make a betting decision for each of nine rounds. Specifically, each participant i had to decide on a value  $x_i \in [0, 200]$  of an initial endowment per round of 200 tokens to bet in a risky lottery. Participants were randomly assigned to one of two groups, i.e., sub-treatment H or sub-treatment L, which differed only in terms of feedback and decision frequency. In the H sub-treatment, participants chose the amount to bet in the risky lottery in each of the nine rounds and were informed after each round about the outcome of the lottery and their earnings from that round. In contrast, in the L sub-treatment, participants were asked to decide on the amount to bet in the lottery in rounds 1, 4, and 7 for three consecutive rounds. Decisions were binding for three rounds, so the amount bet in sub-treatment L remained unchanged for three consecutive rounds. Participants were informed about the outcomes of the lotteries and aggregated earnings only after every third round (i.e., in round 3, the aggregated earnings from rounds 1-3; in round 6, the aggregated earnings from rounds 4-6; and in round 9, the aggregated earnings from rounds 7-9 were shown). According to MLA theory, our prediction was that participants in the L sub-treatment will bet higher amounts than participants in the H sub-treatment, which is explained by a more advantageous perception of the lotteries when their results are presented in a more aggregated way. This procedure was applied in two between-subjects treatments. Participants were randomly allocated to one of the two treatments, i.e., GP

and CG. In treatment GP, we applied the original lottery by Gneezy and Potters (1997) that reads as follows:<sup>2</sup>

You have a chance of 2/3 (67%) to lose the amount you bet and a chance of 1/3 (33%) to win two and a half times the amount you bet.

In addition, in another treatment CG, we introduced the lottery established by Charness and Gneezy (2010) with the following risk profile:

You have a chance of 1/2 (50%) to lose the amount you bet and a chance of 1/2 (50%) to win two and a half times the amount you bet.<sup>3</sup>

Therefore, two treatments were obtained that differed only in terms of the risk profiles of the lotteries employed. Specifically, the lottery in treatment GP was characterized by an expected value  $E(x_i) = 0.17$  for  $x_i = 1$  and a loss probability  $pr_{loss} = 67\%$ . The lottery in CG was characterized by an expected value  $E(x_i) = 0.75$  for  $x_i = 1$  and a loss probability  $pr_{loss} = 50\%$ . Thus, the lottery used in CG appears to be notably more attractive from an expected utility viewpoint, and we hypothesized that overall risk-taking would be higher in this treatment compared to treatment GP. However, according to the theory of MLA, we further hypothesized that treatments would not differ with respect to MLA. For a given round t, participant i's earnings  $\pi_{i,t}$  were given as follows:

$$\pi_{i,t} = \left\{ \begin{array}{ccc} 200 + 2.5x_{i,t} & prob.: 1/3 (GP); & prob.: 1/2 (CG) \\ 200 - x_{i,t} & prob.: 2/3 (GP); & prob.: 1/2 (CG) \end{array} \right\}$$
(1)

For each treatment, we implemented the two sub-treatments, i.e., H and L, varying the decision and feedback frequency, as summarized in Table 1.

Lottery	Treatment	Sub-treatment	
Gneezy and Potters (1997)	$\label{eq:GP:E} \begin{split} \mathbf{GP} \colon E(x_i) &= 0.17 \text{ for } x_i = 1, \\ pr_{loss} &= \frac{2}{3} \end{split}$	н	L
Charness and Gneezy (2010)	$\mathbf{CG}$ : $E(x_i) = 0.75$ for $x_i = 1$ , $pr_{loss} = \frac{1}{2}$	Н	L

**Table 1: Treatment overview.** The table provides a treatment overview varying the lottery properties across treatments GP and CG and the decision/feedback frequency across sub-treatments H and L.

 $<sup>^{2}</sup>$ To ensure a valid comparison to Gneezy and Potters (1997), the instructions in our study were virtually equivalent to those in the original paper. Our instructions differed only with respect to the implementation of the lottery draw, which in our study was performed by a computer.

<sup>&</sup>lt;sup>3</sup>Following Langer and Weber (2001, 2005), we calculated whether MPT can explain possible reversed behavioral patterns when participants are confronted with this lottery. Assuming estimated probability weights of  $\gamma^+$ : 0.61 and  $\gamma^-$ : 0.69 and weighting and value functions by Kahneman and Tversky (1992), for no values of  $\alpha$ ,  $\beta$  and  $\lambda$ , it follows that  $S_1(x) > 0$  when  $S_3(x) < 0$  holds simultaneously, i.e., the myopic value  $S_1(x)$  of this lottery can never be positive if the non-myopic value  $S_3(x)$  of this lottery is not positive at the same time. Thus, MPT would not predict that participants are willing to invest in this lottery in the myopic case (H) while not being willing to invest in the non-myopic case (L).

In an exit questionnaire, we asked participants about their general and financial risk preferences, demographic and socioeconomic characteristics, such as information on age, gender, education, annual gross income, as well as their financial education and investment experience.<sup>4</sup>

We conducted a highly powered trial. Ex-post power analyses showed that our sample size of N = 473 in treatment GP, and N = 464 in treatment CG guaranteed that we obtained 80% power to reliably detect a small effect of Cohen's d = 0.20 with respect to differences in risk-taking between H and L in both treatments. Specifically, in GP, we achieved a statistical power of approximately 99% to detect 71% of the original standardized effect size of Cohen's d = 0.63 in Gneezy and Potters (1997).<sup>5</sup> This effect was related to the measurement of MLA over all nine rounds, which we focused on in this paper.

The experiment was conducted online with 937 US participants on Amazon MTurk. The average age of the participants was 37 years, with 34% of participants being female and 66% of participants being male (see Table A1 for details and further demographic and socioeconomic information).<sup>6</sup> Experimental sessions were held in August and September 2020 and January 2021. The average time participants spent on the experiment was 7.10 minutes (SD: 5.75 minutes). Participants received a flat fee of \$0.75 plus an average bonus incentive of \$1.45 (SD: 0.48) based on their decisions and lottery outcomes. This corresponds to an hourly wage of \$18.59 on average. The experiment was programmed using oTree (Chen et al., 2016).<sup>7</sup>

### 3 Results

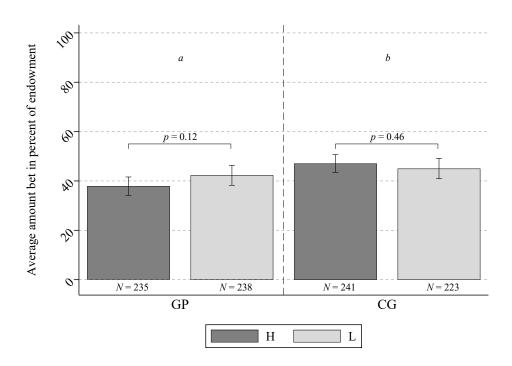
Figure 1 shows the average round bet over nine rounds as a percentage of the initial endowment of 200 tokens for both treatments, i.e., GP and CG, and sub-treatments H and L. To begin our analyses, we first consider treatment GP, which was an online replication of Gneezy and Potters (1997).<sup>8</sup>

#### **Result 1:** *MTurkers in treatment GP did not exhibit behavior consistent with MLA.*

Although displaying the sign predicted by MLA theory, a two-sided, unpaired sample *t*-test indicated that the small difference between H and L in terms of the average percentage bet in the lottery (Cohen's d = 0.15) is not statistically significant, as can be seen at the top of the corresponding first pair of bars in Figure 1 (H: 0.379 - L: 0.423 = -0.044; p = 0.12; N = 473, see Table A3 for details). Thus, in contrast to our hypothesis, we did not find evidence that MTurkers exhibit MLA-compliant behavior. The results contradict the findings of previous studies that have used this experimental design and have found statistically significant evidence of MLA-conforming behavior among different groups, e.g., university students or financial professionals (Gneezy and Potters, 1997; Gneezy et al., 2003; Bellemare et al., 2005; Fellner and Sutter, 2009).

<sup>&</sup>lt;sup>4</sup>The self-reported general and financial risk preferences were based on the German SOEP questionnaire (Dohmen et al., 2011). <sup>5</sup>Recent evidence on the replicability of social science experiments has provided an estimate of the average relative effect size of true positives that is approximately 71% (Camerer et al., 2018).

<sup>&</sup>lt;sup>6</sup>We performed extensive randomization checks to test whether the distributions of demographic, socioeconomic, and risk-taking characteristics differed between treatments and sub-treatments. We found no statistically significant differences in participant characteristics between treatments and sub-treatments, indicating a successful randomization procedure (see Table A2 for details). <sup>7</sup>We refer to the Appendix for screenshots of the software. The experimental software can be accessed using the following link. <sup>8</sup>We applied significance levels of 5% and 0.5% for all statistical tests in this paper (Benjamin et al., 2017) and took a conservative approach by conducting two-sided tests, which was further justified by the empirically confirmed possibility of reverse effects (Langer and Weber, 2001, 2005).



**Figure 1:** Average amount bet in percent for both treatments and sub-treatments. The figure shows the average round bet over nine rounds as a percentage of the initial endowment of 200 tokens for both treatments and sub-treatments (dark gray bars represent sub-treatment H and light gray bars represent sub-treatment L). Whiskers denote 95% confidence intervals. *p* indicates *p*-values of two-sided unpaired sample *t*-tests between sub-treatments H and L. Letters, i.e. *a*, *b*, indicate significance groupings with respect to overall risk-taking. Conditions with a distinct letter differ statistically significantly regarding the average total (H + L) risk-taking (two-sided unpaired samples *t* test,  $\alpha = 0.05$ ). GP: N = 473; CG: N = 464.

**Result 2:** We did not find behavior consistent with MLA in treatment CG and did not find evidence of a variation in the difference in risk taking between L and H across treatments.

As shown in Figure 1, we found no statistically significant difference in MTurkers' risk-taking between H and L in treatment CG, as indicated by the corresponding *p*-value above the bars obtained from two-sided unpaired sample *t*-tests (see Table A3 for details).<sup>9</sup> Interestingly, although not statistically significant, an inverse pattern compared with that predicted by MLA seemed to occur, i.e, participants in sub-treatment H bet more compared to participants in sub-treatment L (H: 0.471 - L: 0.450 = 0.021; p = 0.46; N = 473). The absence of a statistical support for the treatment effects is no sufficient evidence for null effects. As we were highly powered, we performed equivalence tests (TOST) to also test for equivalence with the null hypothesis in both treatments.<sup>10</sup> We followed the approach by Juzek and Kizach (2019) to obtain objective values for the parameter delta ( $\delta$ ) – the minimum worthwhile effect size – based on our data (GP:  $\delta = \pm 0.09$ ; CG:  $\delta = \pm 0.09$ ). For these values of  $\delta$ , equivalence with the null hypothesis regarding the difference in risk-taking between H and L could be statistically supported (Tryon and Lewis, 2008) in both treatments (GP:  $p(T > t_1) < 0.005$ ,  $p(T > t_2) = 0.0493$ ; CG:  $p(T > t_1) = 0.007$ ,  $p(T > t_2) < 0.005$ ). Conducting further equivalence tests in treatment GP, we were able to statistically rule out a difference in risk taking

<sup>&</sup>lt;sup>9</sup>As robustness checks, we also performed the analyses in both treatments using the non-parametric Mann-Whitney U test, which confirmed the results.

<sup>&</sup>lt;sup>10</sup>We used the user-written program *tostt* in Stata (Dinno, 2017)

between H and L of more than about 9 percentage points (Cohen's d = 0.30). In the CG treatment, we were able to statistically rule out a difference of more than about 6.70 percentage points (Cohen's d = 0.22). Next, we ran multivariate Tobit regressions with the average lottery bets over nine rounds as dependent variable to examine the robustness of the results and to test for a difference-in-differences effect (see Table A4 for details). All previous results were confirmed, but we found no variation in differences in bet amounts between participants in the H group and the L group across treatments, i.e., no statistically significant difference-in-difference effect, as indicated by the coefficient  $CG \times L$  in models I and II in Table A4 (model I: p = 0.11; model II: p = 0.214). The results remained robust when we applied randomization inference via permutation tests<sup>11</sup> and when we included general and financial risk preferences, demographic, and socioeconomic characteristics of participants. As an additional robustness check, we checked for data quality and calculated as a proxy the time participants spent on the corresponding instruction screen for the task. On average, it should have taken participants 2.06 minutes to meaningfully read the instructions (2032 characters) for the task (Trauzettel-Klosinski and Dietz, 2012). Strikingly, 45% of participants spent less than 0.15 minutes on this screen. Nevertheless, trimming the sample had no decisive effect, as there was no symmetric or asymmetric cut-off point in terms of processing times on the instruction screen that had a qualitative impact on the results when we repeated all tests with these trimmed samples.

Finally, we tested for aggregate (H + L) differences in risk-taking across treatments. The letters at the top of Figure 1 denote significance groupings with respect to differences in aggregate risk-taking. Treatment conditions with distinct letters did differ statistically significantly in the mean percentage round bet over nine rounds in two-sided unpaired sample *t*-tests ( $\alpha = 0.05$ ). As hypothesized, we found that MTurkers in treatment CG took more risk than MTurkers in treatment GP (GP: 0.401 - CG: 0.461 = -0.060; p = 0.002; N = 973, see Table A3 for details).

# 4 Conclusion

We conducted a highly powered online experiment with 937 participants on Amazon MTurk to test whether MTurkers exhibit MLA. In doing so, we carefully followed the lottery framework of Gneezy and Potters (1997). With our findings, we are unable to confirm MLA-compliant behavior for MTurkers in either treatment as we found small, statistically insignificant differences in risk-taking between H and L together with support for the null hypothesis for standardized differences greater than Cohen's d = 0.30 (0.22) in GP (CG). In addition, we found no difference-in-difference effect between treatments, indicating no effect of the varying risk profiles on risk-taking differences between H and L. The results survived multiple robustness checks. With these findings, we join a growing body of scientific literature suggesting that the relationship between variations in decision and feedback frequency and risk-taking behavior is more complex than has long been assumed. We conclude that the results of previous studies on MLA, or at least the magnitude of the results, are not readily generalizable to other groups of people, which we have shown for MTurkers, a subject pool frequently recruited for online social science experiments (Chandler and Shapiro, 2016).

<sup>&</sup>lt;sup>11</sup>We used the user-written program "ritest" in Stata (Heß, 2017).

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# Appendix

# A1 Additional figures and tables

Table A1: Descriptive statistics of demographic and socioeconomic variables including general and financial risk preferences. The table provides a descriptive overview regarding participants' age (AGE), gender (MALE), education (EDUCATION), annual gross income in USD (INCOME), professional or educational financial experience (FINANCIAL\_SECTOR), investment experience regarding financial products for the past 5 years (INVEST\_EXPERIENCE) and general (RISK\_GENERAL) and financial risk-taking (RISK\_FINANCIAL). RISK\_GENERAL and RISK\_FINANCIAL are ordinal variables ranging from 0 to 10, where 0 indicates participants' not being willing to take risks and 10 participants' being very willing to take risks. For the variables AGE, RISK\_GENERAL and RISK\_FINANCIAL the respective mean and standard deviation while for all other variables the relative distribution across categories is outlined.

Variable	Relative distribution across categories/means and standard deviations
AGE	Mean: 37.37; SD: 10.64
GENDER	Female: 0.34; Male: 0.66; Other: < 0.01;
EDUCATION	No schooling: 0; Nursery school: < 0.01; High school: 0.09;
	Associate degree: 0.04; Bachelor's degree: 0.61 ; Master's degree: 0.24;
	Doctoral degree: 0.01;
INCOME	0 - 13.000 \$: 0.07; 13.000 \$ - 27.000 \$: 0.18; 27.000 \$ - 47.000 \$: 0.34;
	47.000 - $81.000$ ; $0.33$ ; > $81.000$ ; $0.08$ ;
FINANCIAL_SECTOR	Having worked in the finance sector/financial education: 0.47;
	Not having worked in the finance sector/no financial education: 0.53;
INVEST_EXPERIENCE	Having invested in financial products: 0.34;
	Not having invested in financial products: 0.66;
RISK_GENERAL	Mean: 8.02; SD: 2.70;
	(0: not at all willing to take risks, 10: very willing to take risks);
RISK_FINANCE	Mean: 7.90; SD: 2.77;
	(0: not at all willing to take risks, 10: very willing to take risks);

**Table A2: Randomization checks across treatments and sub-treatments.** The variable AGE indicates the participants' age in years, MALE is a binary dummy taking the value of 0 for female subjects and 1 for male participants. STUDY\_ECONOMICS is a binary variable, which equals 1 for participants enrolled in economics, business, or business law and 0 for all other study programs. FINANCIAL\_SECTOR is a dummy taking the value of 1 for decision makers who have already worked in the financial sector or who have specific financial education and 0 for participants who have not. INVEST\_EXPERIENCE represents a binary dummy taking the value of 1 for participants who have invested in financial products in the last five years. INCOME is an ordinal variable comprised of the total annual gross income quintiles in the US. EDUCATION is a 6-item ordinal variable taking the value of 0 for participants with nursery school completed up to a value of 6 for participants with a PhD. RISK\_FINANCIAL is an ordinal variable representing self-reported risk preferences on a 10-point Likert scale in the financial domain. RISK\_GENERAL is an ordinal variable representing self-reported risk preferences on a 10-point Likert scale in the general domain.

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Note: \* p < 0.05, \*\* p < 0.005

**Table A3: Differences between treatments and sub-treatments.** The table shows pairwise differences in the average bet amount over nine rounds in percent of the endowment between sub-treatments H and L in treatments GP and CG using two-sided unpaired sample *t*-tests. The table also shows pairwise differences in the total average bet amount (H + L) over nine rounds in percent of the endowment between treatments.

Treatments obs		Sub-Treatment Difference: H-L		std. err.	comb. std. dev	$pr(\mid T \mid > \mid t \mid)$
CG	473	0.021	(0.471 - 0.450)	0.028	0.298	0.456
Pairwise comp.	obs	Treatmen	nt Difference:	std. err.	comb. std. dev	$pr(\mid T \mid > \mid t \mid)$
GP-CG	937	-0.060**	(0.401 - 0.461)	0.020	0.303	0.002

*Note:* \* *p* < 0.05, \*\* *p* < 0.005

Table A4: Multivariate Tobit regressions on differences between treatments and sub-treatments. The table shows multivariate Tobit regressions with the average percentage amount bet by participants as dependent variable. The variable CG is a binary dummy taking on the value 1 for participants in treatment CG and 0 for participants in treatment GP. L represents a binary dummy variable taking the value 1 for decision makers in the low-frequency feedback sub-treatment and 0 for their peers in the high-frequency feedback sub-treatment, i.e., H.  $CG \times L$  represents an interaction term between CG and L. The variable AGE indicates the participants' age in years, MALE is a binary dummy taking the value of 0 for female subjects and 1 for male participants. FINANCIAL\_SECTOR is a dummy taking the value of 1 for decision makers who have already worked in the financial sector or who have specific financial education and 0 for participants who have not. INVEST\_EXPERIENCE represents a binary dummy taking the value of 1 for participants who have invested in financial products in the last five years. INCOME is an ordinal variable comprised of the total annual gross income quintiles in the US. EDUCATION is a 6-item ordinal variable taking the value of 0 for participants with nursery school completed up to a value of 6 for participants with a PhD. RISK\_FINANCIAL is an ordinal variable representing self-reported risk preferences on a 10-point Likert scale in the financial domain. RISK\_GENERAL is an ordinal variable representing self-reported risk preferences on a 10-point Likert scale in the general domain. "Permute p" reports the p-values of the corresponding coefficient, obtained from permutation tests with 1,000 random draws.

	Model (I)	Model (II)
CG	$0.032^{**}$	0.030**
	(0.010)	(0.010)
L	0.074	0.058
	(0.041)	(0.041)
CG  imes L	-0.023	-0.017
	(0.014)	(0.014)
AGE		0.001
		(0.001)
MALE		0.070**
		(0.022)
EDUCATION		-0.018
		(0.011)
FINANCIAL_SECTOR		$-0.069^{**}$
		(0.024)
INCOME		0.010
		(0.011)
INVEST_EXPERIENCE		0.045
		(0.025)
RISK_FINANCIAL		0.005
		(0.006)
RISK_GENERAL		0.010
		(0.006)
Constant	$0.348^{**}$	0.136
	(0.029)	(0.077)
Permute $p CG \times L$	0.125	0.225
Observations	937	937
$Prob > Chi^2$	0.008	0.000
Pseudo R <sup>2</sup>	0.017	0.059
		<i>(</i> )

\*p < 0.05, \*\*p < 0.005. Dependent variable: Average amount bet in percent of endowment  $\left(\frac{x_i}{200}\right)$ . Standard errors in parentheses.

# A2 Screenshots of the Experiment

#### General Instructions

#### Dear participant,

Thank you for participating in this online experiment!

Please read the instructions for the experiment carefully. All statements in the instructions are true. Your payoff for this experiment also depends on how well you understood the instructions. The experiment and the analyses of the data are anonymous. Your answers will only be analysed for the purpose of scientific research.

The participation takes about 15 minutes. Please note that you will only receive a payoff if you have carried out the experiment to the end.

The experiment consists of one main part and an exit questionnaire. The instructions for the main part are displayed at the beginning of the experiment and can be accessed at any time during the main experiment by clicking on the button "*Instructions*".

All personal descriptions in the experiment apply to all genders. By clicking on "Continue" you accept the above conditions.



#### **Figure A1: General Instruction**

#### Instructions for the main part of the experiment

The main part of the experiment consists of 9 successive rounds. In each round you will start with an amount of 200 experimental currency units (ECU). You must decide which part "x" of this amount (between 0 ECU and 200 ECU) you wish to bet in the following lottery.

You have a chance of 2/3 (67%) to lose the amount you bet and a chance of 1/3 (33%) to win 2.5 times the amount you bet.

Hence, your earnings in the lottery are determined as follows. If you have decided to put an amount "x" in the lottery, then your earnings for the round are equal to -x if you lose in the lottery and equal to  $+2.5 \cdot x$  if you win in the lottery. Your **total earnings** for the round are equal to 200 ECU (your starting amount) plus your earnings in the lottery.

In the following table you see a general example of the calculation of your total earnings for the first round.

Amount bet	Realization of the lottery: Win	Realization of the lottery: Loss
$x \ (0 \le x \le 200)$	200 + 2.5 · x	200 <i>- x</i>

After that, you will be informed about your total earnings for the first round. Then you are requested to indicate your choice for the next round. At the beginning of the second round you again start with an amount of 200 ECU, a part "x" of which you can bet in the lottery. The same procedure as described above determines your earnings for the second round (same calculation as in the table above). Again, at the end of the second round you will be informed about your total earnings for the second round. All subsequent rounds will also proceed in the same manner.

Please note that your total earnings for all rounds are collected, which means that in later rounds you cannot bet money you already earned. After the last round has been completed, your total earnings for all rounds will be summed and exchanged in Dollars at a rate of 1:1500 (divided by 1500). This amount determines your bonus payoff for the experiment.

Next

#### Figure A2: Specific Instruction for Treatment GP and Sub-treatment H

#### Instructions for the main part of the experiment

The main part of the experiment consists of 9 successive rounds. In each round you will start with an amount of 200 experimental currency units (ECU). You must decide which part "x" of this amount (between 0 ECU and 200 ECU) you wish to bet in the following lottery.

# You have a chance of 2/3 (67%) to lose the amount you bet and a chance of 1/3 (33%) to win 2.5 times the amount you bet.

Please note that you fix your choice for the next three rounds. Thus, if you decide to bet an amount "x" in the lottery for round 1, then you also bet the same amount "x" in the lottery for rounds 2 and 3. Therefore, your decision applies for 3 consecutive rounds.

Hence, your earnings in the lottery for the three rounds are determined as follows. If you have decided to put an amount "x" in the lottery, then your earnings are equal to -x for each loss in the lottery and equal to  $+2.5 \cdot x$  for each win in the lottery. Your **total earnings** for the three rounds are equal to 600 ECU (three times your starting amount of 200 ECU) plus your total earnings for the 3 lottery rounds.

Amount bet	Realization of the lottery Round 1 - Round 2 - Round 3	Total earnings after 3 rounds
$x(0\leq x\leq 200)$	Win-Win-Win	$600 + 2,5 \cdot 3 \cdot x$
$x(0\leq x\leq 200)$	Win-Win-Loss	$600 - x + 2.5 \cdot 2 \cdot x$
$x(0\leq x\leq 200)$	Win-Loss-Win	$600 - x + 2.5 \cdot 2 \cdot x$
$x(0\leq x\leq 200)$	Win-Loss-Loss	$600 - 2 \cdot x + 2.5 \cdot x$
$x(0\leq x\leq 200)$	Loss-Win-Win	$600 - x + 2.5 \cdot 2 \cdot x$
$x(0\leq x\leq 200)$	Loss-Win-Loss	$600 - 2 \cdot x + 2.5 \cdot x$
$x(0\leq x\leq 200)$	Loss-Loss-Win	$600 - 2 \cdot x + 2.5 \cdot x$
$x \; (0 \leq x \leq 200)$	Loss-Loss-Loss	600 - 3 · <i>x</i>

In the following table you see a general example of the calculation of your total earnings for the first 3 rounds.

After that, you will be informed about your total earnings for the first 3 rounds (1 to 3). Then you are requested to indicate your choice for the next three rounds (4 to 6). For each of the three rounds you again start with an amount of 200 ECU, a part "x" of which you can bet in the lottery. The same procedure as described above determines your earnings for the next three rounds (4 to 6). The subsequent three rounds (7 to 9) will also proceed in the same manner.

Please note that your total earnings for all rounds are collected, which means that in later rounds you cannot bet money you already earned. After the last round has been completed, your total earnings for all rounds will be summed and exchanged in Dollars at a rate of 1:1500 (divided by 1500). This amount determines your bonus payoff for the experiment.

#### Next

#### Figure A3: Specific Instruction for Treatment GP and Sub-treatment L

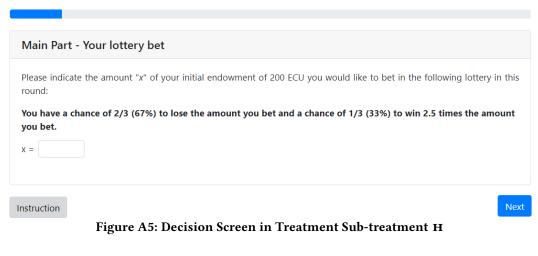
#### Main Part - Lottery bet

The experiment now starts with the main part.

Next

#### Figure A4: Introductory Screen to the Main Part

Round 1 of 9



Round 1 of 9

Main Part - Your lottery bet
Please indicate the amount "x" of your initial endowment of 200 ECU you would like to bet in the following lottery in the next three rounds:
You have a chance of 2/3 (67%) to lose the amount you bet and a chance of 1/3 (33%) to win 2.5 times the amount you bet.
x =
Instruction
Figure A6: Decision Screen in Treatment GPand Sub-treatment L
Round 1 of 9

Main Part - Your total earnings for this round				
In the following table you see the realization of the lottery in round 1 and your total earnings in ECU for the first round.				
	Round	Realization of the lottery	Total earnings	
	1	Loss	100.00 ECU	
				Next

Figure A7: History Screen in Sub-treatment H

#### Round 3 of 9

Main Part - Your total earnings for this round				
In the following table three rounds.	e you see the	realization of the lottery in round 1, 2 a	and 3 and your total earn	ings in ECU for these
	Round	Realization of the lottery	Total earnings	
	1	Toss		
	2	Coss	150.00 ECU	
	3	coss		

Next

### Figure A8: History Screen in Sub-treatment L

Exit Questionnaire	
On the following two pages, we would like you to fill out an exit questionnaire. Please answer all questions honestly.	
Subsequently, you will be informed about your bonus payoff for the experiment.	
	Next

# Figure A9: Introductory Screen for the Final Questionnaire

Individual Preferences
How do you see yourself:
Are you generally a person who is fully prepared to take risks or do you avoid taking risks?
unwilling to take risks OOOOOOOOOOOOOOOOO fully prepared to take risks
How do you see yourself:
Regarding financial matters, are you a person who is fully prepared to take risks or do you try to avoid taking risks?
unwilling to take risks $\bigcirc$
Nex

### Figure A10: General and Financial Risk Preferences

Individual Information	
How old are you?	
What is your gender?	
<ul> <li>Female</li> <li>Male</li> <li>Other</li> </ul>	
What is your highest level of education?	
O No schooling completed	
<ul> <li>Nursery school to 8th grade</li> <li>High school graduate, diploma or the equivalent (e.g., GED)</li> </ul>	
<ul> <li>Angin school graduate, diploma of the equivalent (e.g., dcb)</li> <li>Associate degree</li> </ul>	
O Bachelor's degree	
O Master's degree	
<ul> <li>Doctoral degree</li> </ul>	
Have you ever worked in the financial sector or do you have specific financial education?	
O No	
O Yes	
Have you invested in financial products in the last 5 years (z.B. stocks, bonds, funds, etc.)?	
○ No	
○ Yes	
What is your total annual gross income in USD (total annual income before taxes)? Please choose one of the ranges below, where you are quite sure that your annual gross income lies.	
○ 0 \$ - 13.000 \$	
O 13.001 \$ - 27.000 \$	
○ 27.001 \$ - 47.000 \$	
○ 47.001 \$ - 81.000 \$	
○ > 81.000 \$	

## Figure A11: Personal Questions

Your Payoff for the Experiment
Over all rounds you have earned 2080.50 ECU. Therefore, your bonus payoff for the experiment amounts to \$1.40.
Thank your for your participation. You have completed the study. Your completion code is LOTT2020.

Figure A12: Payoff Screen

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2021-12

Rene Schwaiger, Laura Hueber

Do MTurkers Exhibit Myopic Loss Aversion?

### Abstract

We present results from a highly powered online experiment with 937 participants on Amazon Mechanical Turk (MTurk) that examined whether MTurkers exhibit myopic loss aversion (MLA). The experiment consisted of measuring MLA-compliant behavior in two between-subjects treatments that differed only regarding the risk profile of the risky asset employed. We found no statistically significant evidence of MLA-compliant behavior among MTurkers in both treatments.

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