University of Innsbruck

No myopic loss aversion in adolescents? An experimental note

Daniela Glätzle-Rützler, Matthias Sutter, Achim Zeileis

Working Papers in Economics and Statistics

2013-07

Research Platform eeecon
Empirical and Experimental Economics
University of Innsbruck
http://eeecon.uibk.ac.at/

University of Innsbruck
Working Papers in Economics and Statistics

The series is jointly edited and published by

- Department of Economics
- Department of Public Finance
- Department of Statistics

Contact Address:
University of Innsbruck
Department of Public Finance
Universitaetsstrasse 15
A-6020 Innsbruck
Austria
Tel: + 43 512 507 7171
Fax: + 43 512 507 2970
E-mail: eeecon@uibk.ac.at

The most recent version of all working papers can be downloaded at
http://eeecon.uibk.ac.at/wopec/

For a list of recent papers see the backpages of this paper.

No myopic loss aversion in adolescents?

– An experimental note

Daniela Glätzle-Rützler[†]
Department of Public Finance, University of Innsbruck, Austria
Matthias Sutter[#]
Department of Public Finance, University of Innsbruck, Austria
Department of Economics, University of Gothenburg, Sweden
Achim Zeileis[Δ]
Department of Statistics, University of Innsbruck, Austria

Abstract

Myopic loss aversion (MLA) has been found to play a persistent role for investment behavior under risk. We study whether MLA is already present during adolescence. Quite surprisingly, we find no evidence of MLA in a sample of 755 adolescents. This finding is at odds with previous findings, and it might be explained by self-selection effects. In other dimensions, however, we are able to replicate stylized findings in our pool of adolescents, such that teams invest higher amounts than individuals and that women invest less than men.

Keywords: myopic loss aversion; experiment; adolescents; team-decision making
JEL classification: C91; D03

[†] Address for correspondence: Department of Public Finance, University of Innsbruck, Universitaetsstrasse 15; A-6020 Innsbruck, Austria. E-mail: daniela.ruetzler@uibk.ac.at, Telephone: + 43 (0)512-507-7467, Fax: + 43 (0)512-507-2788
[#] Department of Public Finance, University of Innsbruck, Universitaetsstrasse 15; A-6020 Innsbruck, Austria.
[Δ] Department of Statistics, University of Innsbruck, Universitaetsstrasse 15; A-6020 Innsbruck, Austria.

1 Introduction

Myopic loss aversion (MLA) has been put forward by Benartzi and Thaler (1995) as an explanation for the "equity premium puzzle" which refers to the evidence that the risk premium on stocks is inexplicably high compared to yields on bonds and it is unreasonable to assume that risk aversion alone can explain it (Mehra and Prescott, 1985). The concept of MLA combines loss aversion (Kahneman and Tversky, 1979; Tversky and Kahneman, 1992) and mental accounting (Kahneman and Tversky, 1984; Thaler, 1985). In the context of financial markets, loss aversion refers to an investor's tendency to weigh losses more heavily than gains, while myopia – a mental accounting mechanism – implies focusing on short-term results rather than on the longer horizon of an investment. The combination of both, loss aversion and mental accounting, can explain at least parts of the equity premium puzzle. By now, MLA is considered as a robust behavioral pattern. The experimental evidence is impressive, starting with the seminal papers of Gneezy and Potters (1997) and Thaler et al. (1997). They have shown that subjects are willing to invest more money into a risky gamble the longer the investment horizon (the less flexible they are to change their investment decision) and the less often they receive feedback. By and large, this main result has been replicated in Barron and Erev (2003), Gneezy et al. (2003), Bellemare et al. (2005), Langer and Weber (2008), Fellner and Sutter (2009), or Charness and Gneezy (2010). Interestingly, professionals do even worse than student subject pools. Haigh and List (2005) have shown that the extent of MLA is larger for Chicago Board of Trade traders than for students, and Eriksen and Kvaløy (2010) have found the same pattern for financial advisors of a Norwegian bank.

So far, the evidence for MLA and its behavioral effects has been collected on adult samples. In this paper, we present an experiment on MLA with adolescents, aged 11 to 18 years. Studying the behavior of adolescents is motivated by a statement of Colin Camerer (2003, p.66) who notes that children are "*closer* to the self-interest prediction of game theory

than virtually any adult population" and hints at the fact that experience (through age) might drive actual behavior even further away from standard predictions instead of letting it converge to them. In this note, we examine whether the behavioral effects of MLA are already existent at an earlier age than has been investigated in previous studies. In addition to that, we study whether teams (of adolescents) behave significantly different from individuals with respect to investment levels and myopic loss aversion. This latter issue can serve as a robustness check of earlier results by Sutter (2007) who has shown that teams are also prone to loss aversion, but that the effect is dampened, and that teams invest higher amounts than individuals. We investigate whether these results also hold for adolescents.

Quite surprisingly, we find no evidence of MLA in our data with 755 adolescents, although their average investment levels are somewhat comparable to earlier studies. This finding is at odds with previous findings, and in the concluding section we speculate about possible explanations. Concerning the effects of team decision making, we can confirm higher investment levels for teams than for individuals, but our teams are also not prone to MLA. Women are also found to invest lower levels, which is consistent with previous findings of Charness and Gneezy (2010), for instance.

Studying dynamic effects across rounds we observe that our participants are subject to two anomalies in their investment choice. (i) A short-sighted gambler's fallacy due to decreased investments after experiencing a win in the previous (block of) round(s). (ii) A long-sighted hot hand belief due to increased investments per win in previous rounds, thus somewhat counterbalancing the short-sighted effect of a gambler's fallacy.

The rest of the paper is organized as follows: Section 2 presents the experimental design. The results are described in Section 3. Section 4 discusses our findings and their implications for the literature on MLA and concludes the paper.

2 Experimental design

Our design is based on Gneezy and Potters (1997). In each of nine rounds subjects were endowed with 100 tokens and had to decide how much of this endowment to invest in a lottery with positive expected value and two possible outcomes: (i) With a likelihood of 1/3 the participant wins the lottery, resulting in a payoff of 100+2.5*X*, where *X* denotes the invested amount, (ii) with a likelihood of 2/3 the participant loses the invested amount, i.e. she earns 100-*X*. At the end of the experiment, subjects received their cumulative earnings over all nine rounds.

In our 2x2-design subjects made their decisions (i) either *individually* or in a *2-person-team* and (ii) either under the condition *SHORT* or *LONG*. 2-person-teams were randomly assigned before the start of a session, thus a team was either single sex or mixed sex. Marginal incentives were held constant across decisions made by individuals or in teams as the full amount earned across the nine rounds was paid to each team member in the case of team decision making. In condition SHORT, the amount *X* to be invested in the lottery had to be chosen anew in each of the nine rounds. Feedback about the outcome of the lottery and the resulting earnings was given after each round. In condition LONG, the choice of the amount *X* was made in rounds one, four and seven, and in each case it was implemented for three consecutive rounds. Feedback on the outcome of the lottery and on earnings was given after rounds three, six, and nine.

Tab. 1 about here

The experiment was conducted in four grammar schools, comparable to US high schools, in Innsbruck and Schwaz (25 km from Innsbruck), two cities located in the Federal State of Tyrol, Austria. The study was approved by the International Review Board of the University of Innsbruck, the Central School Administration Board of Tyrol, and the headmasters of the

participating schools gave their permission to run the experiment in school during regular school hours. Participation in the computerized experiment (Fischbacher, 2007) was voluntary, but only 5 parents opted their child out, and no single child opted out. Altogether 755 students, aged 11/12 years (grade 6) to 17/18 years (grade 12) participated (see Table 1). 370 of them were randomly assigned to the teams-condition. The instructions were explained to all students in class and questions were answered privately. In order to guarantee understanding, each participant had to go through several comprehension questions and was only allowed to continue with the experiment as soon as all questions were answered correctly. Students in grades 6 and 8 faced an exchange rate of 0.5 Euro-cents per token, while students from grades 10 and 12 were rewarded with 1 Euro-cent per token earned in the experiment. The duration of the experiment was approximately 50 minutes including a brief background questionnaire.

3 Experimental results

3.1 Overall results

First, we investigate whether investment levels are different between SHORT and LONG, which would be a standard consequence of MLA. In Figure 1 we present the average investment level per round (and the standard errors), separately for the younger group of participants (grades 6 and 8) and the older group (grades 10 and 12), for SHORT and LONG, and for individual and team decision making. Surprisingly, we do not find any significant differences in investment levels between SHORT and LONG across individuals (younger group: $p = 0.189$, $N = 226$; older group: $p = 0.404$, $N = 159$, two-sided Mann-Whitney U-tests) and teams (younger group: $p = 0.788$, $N = 115$; older group: $p = 0.217$, $N = 70$).

Fig. 1 about here

At the same time, we see from Figure 1 that teams invest on average higher amounts than individuals. This effect is robust across the condition SHORT (younger group: $p = 0.034$, $N = 173$; older group: $p = 0.001$, $N = 112$, two-sided Mann-Whitney U-tests) and LONG (younger group: $p = 0.000$, $N = 168$; older group: $p = 0.000$, $N = 117$). We summarize as our first results:

Result 1. The investment levels of adolescents do not indicate myopic loss aversion. This holds true both for decisions taken individually and in teams.

Result 2. Investment decisions by teams are significantly higher than for individuals, both in condition SHORT and LONG.

Our non-parametric results are confirmed and expanded in a linear regression analysis (see Table 2). We regress the amounts invested in the lottery in each of the rounds (round 1 through 9 in condition SHORT; round 1, 4 and 7 in condition LONG) on the following explanatory variables: In model (1) we use a dummy for team (equal to one in a 2-person-team), a dummy for the older age group (grades 10 and 12), a dummy for the condition SHORT (equal to one in SHORT), a dummy for "mixed gender" (equal to one if the team composition is of mixed gender), a dummy for "only male" (equal to one in case of one male in individual decision making and two males in team decisions making), and (mean) age (of an individual decision maker or a team). Finally, we include interaction terms between the dummies "Team", "Older group", and "SHORT" as well as an interaction of "Older group" and "(mean) age" in order to see whether we can pool the data for the younger group (6^{th} and 8^{th} graders) and the older group (10^{th} and 12^{th} graders).

Table 2 about here

In line with our non-parametric results we do not find any significant influence of the treatment SHORT, neither in individual or team decisions nor in the younger or older age group. We therefore estimated a second model (not reported here) which excludes all control variables that include condition SHORT. A Wald test confirms that this exclusion does not significantly deteriorate the model fit ($p = 0.648$). Moreover we note in model (1) of Table 2 that the coefficients of the dummies "Mixed gender" and "Only male" are both highly significant and roughly of equal size. Hence, we test whether a simple dummy of "(at least) one male" as decision maker is sufficient for capturing all gender-related differences and observe that this is the case ($p = 0.475$, Wald test). This leads us to the simpler model (2) reported in Table 2. The results confirm our earlier finding that teams invest on average a significantly higher amount into the lottery than individuals. While teams in the younger age group invest on average 5.7 percentage points more than individuals, this effect is much more pronounced with 18.5 percentage points in the older age group.

Furthermore, we find a significant positive correlation between "(at least) one male" and the invested amount. Male individual decision makers or teams with at least one male subject invest on average 10.7 percentage points more than female individual decision makers or purely female teams.[1] Finally, significant age effects are only present in the older age group, where investments increase on average by 4.1 percentage points per year of age. We visualize these findings in Figure 2 and summarize them as follows:

Result 3. Male decision makers (single males or teams with at least one male subject, respectively) make on average higher investments than female decision makers.

Result 4. Investment levels increase with age in the older age group, while there is no age effect in lower level classes.

Results 1 and **2** are confirmed by the linear regression analysis.

[1] This gender effect seems consistent with earlier findings on gender differences in risk taking (see Croson and Gneezy, 2009, or Charness and Gneezy, 2012).

Figure 2 about here

3.2 Dynamic effects: Gambler's fallacy and hot hand belief

So far, the analysis has focused on the treatment effects as well as the effect of individual characteristics of the decision makers on overall investment levels across all rounds. Now we consider the dynamic structure of the experiment and examine how subjects react to past outcomes. For this purpose, we construct a variable called "short-sighted dependency" that indicates the outcome of the last investment and measures how subjects react to the immediate past (Clotfelter and Cook, 1993). In the SHORT treatment, the variable equals one if the investment in the previous round was successful. In treatment LONG, the variable measures the fraction of successful investments in the past three rounds (i.e., rounds 1-3, or 4-6, or 7-9), and it can be $j/3$, with $j = 0, \ldots, 3$. The variable called "long-sighted dependency" captures the cumulative number of wins over all previous rounds, measuring whether successful investments in the past induce subjects to take more risks in the present (Thaler and Johnson, 1990).

Table 3 about here

As the variables "short-sighted dependency" and "long-sighted dependency" are not available for the first round, the observations from round 1 are dropped. Hence, to assess the significance of the dynamic effects, the (non-dynamic) model 2 of Table 2 is refitted first with the reduced number of observations. This changes the coefficients of the new model somewhat (see model 1 in Table 3), but all coefficients are still very similar and all qualitative results remain the same. In model 2 of Table 3 we include the dynamic variables which significantly improves the fit of the model ($p = 0.000$, Wald-test). While none of the previously discussed results changes qualitatively, it turns out that both dynamic effects are

highly significant. A win in the previous (block of) round(s) decreases the investment significantly by 11 percentage points in the following round (short-sighted gambler's fallacy), while the investment level increases by 2.6 percentage points per win in previous rounds (long-sighted hot hand belief). We also checked whether the dynamic effects are contingent on treatment (SHORT vs. LONG, or individual vs. team decision making), gender, or age group. We found that the extent of the short- and long-sighted effects are not significantly different between SHORT and LONG ($p > 0.3$), across gender ($p > 0.4$), or across age groups ($p > 0.3$). However, the dynamic effects differ significantly with respect to individual or team decisions ($p = 0.000$). Model 3 in Table 3 reveals that there is no difference concerning the "long-sighted hot hand belief", whereas the short-sighted gambler's fallacy is more pronounced in teams (a reduction of investments of 19.9 percentage points after a win in the previous (block of) round(s)) as opposed to individual decision makers (reduction of 6.7 percentage points).

Figure 3 visualizes these dynamic effects and shows that the pronounced team effect is dampened in rounds following a win in a previous (block of) round(s). After experiencing a win in a previous (block of) round(s) the team effect is cancelled out in the younger age group, while in the older age group it is largely reduced.

Figure 3 about here

Result 5. Adolescents are subject to two anomalies in their lottery investment decisions. (i) A short-sighted gambler's fallacy leads them to decrease their investments after experiencing a win in the previous (block of) round(s) while this effect is counterbalanced by (ii) a long-sighted hot hand belief which increases investments with the number of previous wins.

Results 1 to 4 are confirmed by the dynamic linear regression analysis.

4 Discussion and conclusion

We have investigated the existence of myopic loss aversion in a sample of 755 adolescents, aged 11/12 to 17/18 years. Quite surprisingly, we have found no evidence of myopic loss aversion. As far as we can tell, this is the first paper documenting the absence of myopic loss aversion in a controlled experiment that lets subjects make risky choices either with a short or a long investment horizon, which is at odds with existing studies (see, e.g., Gneezy and Potters, 1997; Thaler et al., 1997; Barron and Erev, 2003; Gneezy et al., 2003; Bellemare et al., 2005; Haigh and List, 2005; Langer and Weber, 2008; Fellner and Sutter, 2009; Charness and Gneezy, 2010; Eriksen and Kvaløy, 2010;). Our sample is different from all previous studies as we have investigated adolescents, motivated by an attempt to examine whether the behavioral anomaly of MLA also prevails in the pre-adulthood period. It seems it does not, making age one potential candidate for the different results. Yet, we consider age an unlikely candidate to explain the non-existence of MLA-effects in our sample, because the oldest age group of 17/18 year olds – where we don't find evidence for MLA either – is very close to the age groups included in many studies with university students (like in Sutter, 2007, or Fellner and Sutter, 2009). Rather, an important feature of our sample is that it is largely unaffected by any kind of self-selection. Recall that the experiment was run during regular school hours, with no children opting out from participation. This is different from any university or college subject pool (and also any pool of professionals) with which experiments on MLA have been conducted before. While we have no proof that the issue of self-selection may explain our findings and how they relate to previous work, we consider this a likely candidate explanation that deserves future investigation. In any case, we consider our findings important to document that myopic loss aversion may not be the persistent behavioral anomaly that it has become to be considered.

While our results on myopic loss aversion stand out from the rest of the literature, it is reassuring to conclude with the observation that we have been able to replicate two other

general patterns that have been observed in experiments on myopic loss aversion. First, we have found that teams invest higher amounts than individuals, confirming earlier evidence from Sutter (2007). And, second, women have been found to invest less than men, which is consistent with earlier findings of Charness and Gneezy (2010), for instance. Hence, we are confident that our main result on (the absence of) myopic loss aversion is not driven by having chosen a subject pool that is different in behavior from all other known ones in each and every aspect, but that there is more to be learned about the persistence of myopic loss aversion in risky investments.

Acknowledgments

We would like to thank Thomas Plankensteiner from the State Board of Education of Tyrol (Landesschulrat für Tirol) and the headmasters of the participating schools (Max Gnigler, Hermann Lergetporer, Bernhard Schretter, and Peter Paul Steinringer) for making this study possible. Financial support from the Austrian Central Bank (Jubiläumsfondsprojekt 12588) is gratefully acknowledged.

References

Barron, G. and I. Erev (2003). Small feedback-based decisions and their limited correspondence to description-based decisions. *Journal of Behavioral Decision Making* 16, 215-233.

Beck, N. and J. N. Katz (1995). What to do (and not to do) with time-series cross-section data. *American Political Science Review* 89, 634-647.

Bellemare, C., M. Krause, S. Kröger and C. Zhang (2005). Myopic loss aversion: Information feedback vs. investment flexibility. *Economics Letters* 87, 319-324.

Benartzi, S. and R. Thaler (1995). Myopic loss aversion and the equity premium puzzle. *Quarterly Journal of Economics* 110, 73-92.

Camerer, C. (2003). *Behavioral game theory. Experiments in strategic interaction*. Princeton, Princeton University Press.

Charness, G. and U. Gneezy (2010). Portfolio choice and risk attitudes: An experiment. *Economic Inquiry* 48, 133-146.

Charness, G. and U. Gneezy (2012). Strong evidence for gender differences in risk taking. *Journal of Economic Behavior and Organization* 83, 50-58.

Clotfelter, C. T. and P. J. Cook (1993). The "gambler's fallacy" in lottery play. *Management Science* 39, 1521-1525.

Croson, R. and U. Gneezy (2009). Gender differences in preferences. *Journal of Economic Literature* 47, 1-27.

Eriksen, K. and O. Kvaløy (2010). Do financial advisors exhibit myopic loss aversion? *Financial Markets and Portfolio Management* 24, 159-170.

Fellner, G. and M. Sutter (2009). Causes, consequences, and cures of myopic loss aversion – An experimental investigation. *Economic Journal* 119, 900-916.

Fischbacher, U. (2007). Z-tree: Zurich toolbox for readymade economic experiments. *Experimental Economics* 10, 171-178.

Gneezy, U. and J. Potters (1997). An experiment on risk taking and evaluation periods. *Quarterly Journal of Econoimcs* 102, 631-645.

Gneezy, U., A. Kapteyn and P. Potters (2003). Evaluation periods and asset prices in a market experiment. *Journal of Finance* 58, 821-837.

Haigh, M. and J. List (2005). Do professional traders exhibit myopic loss aversion? An experimental analysis. *Journal of Finance* 60, 523-534.

Kahneman, D. and A. Tversky (1979). Prospect theroy: An analysis of decision under risk. *Econometrica* 47, 263-291.

Kahneman, D. and A. Tversky (1984). Choices, values and frames. *American Psychologist* 39, 341-350.

Langer, T. and M. Weber (2008). Does commitment or feedback influence myopic loss aversion? An experimental analysis. *Journal of Economic Behavior and Orgainzation* 67, 810-819.

Mehra, R. and E. Prescott (1985). The equity premium: A puzzle. *Journal of Monetary Economics* 15, 145-161.

Sutter, M. (2007). Are teams prone to myopic loss aversion? An experimental study on individual versus team investment behavior. *Economics Letters* 97, 128-132.

Thaler, R. (1985). Mental accounting and consumer choice. *Marketing Science* 4, 199-214.

Thaler, R. and E. J. Johnson (1990). Gambling with the house money and trying to break even: The effect of prior outcomes on risky choice. *Management Science* 36, 643-660.

Thaler, R., A. Tversky, D. Kahneman and A. Schwartz (1997). The effect of myopia and loss aversion on risk taking: An experimental test. *Quarterly Journal of Economics* 112, 647-661.

Tversky, A. and D. Kaheman (1992). Advances in prospect theory cumulative representation of uncertainty. *Journal of Risk and Uncertainty* 5, 297-323.

Table 1: Number of subjects in different treatments

		SHORT	LONG	SUM
Younger group (grades 6 and 8, aged 11 to 14 years)[&]	Individuals	116	110	**226**
	Teams*	114	116	**230**
Older group (grades 10 and 12, aged 15 to 18 years)[$]	Individuals	71	88	**159**
	Teams*	82	58	**140**
SUM		**383**	**372**	**755**

[*] The number of 2-person teams is given by dividing the number of subjects by 2.

[&]Two subjects are already 15 years old

[$]Four subjects are already 19 years old, one is 20 years old and one is 21 years old

Table 2: OLS regression on invested amounts. Results for 570 players (i.e., individuals or teams) and for rounds 1 through 9 and rounds 1, 4 and 7 for players in the SHORT and LONG treatment, respectively.

Explanatory variables	Dependent variable Invested amount	
	(1)	(2)
Team	6.045	5.701*
	(4.749)	(3.377)
Older group (grades 10 and 12)	-78.115**	-75.671**
	(31.890)	(31.884)
SHORT	0.100	
	(3.596)	
Mixed gender	13.010***	
	(4.451)	
Only male	10.064***	
	(2.847)	
(at least) one male		10.658***
		(2.572)
(mean) age	0.956	1.007
	(1.395)	(1.396)
Team*older group	19.912***	12.794**
	(6.895)	(5.138)
Team*SHORT	-1.681	
	(5.904)	
Older group*SHORT	2.520	
	(5.308)	
Older group*(mean) age	4.187**	4.138**
	(2.097)	(2.097)
Team*older group*SHORT	-9.529	
	(9.386)	
Intercept	30.989*	30.184*
	(17.871)	(17.808)

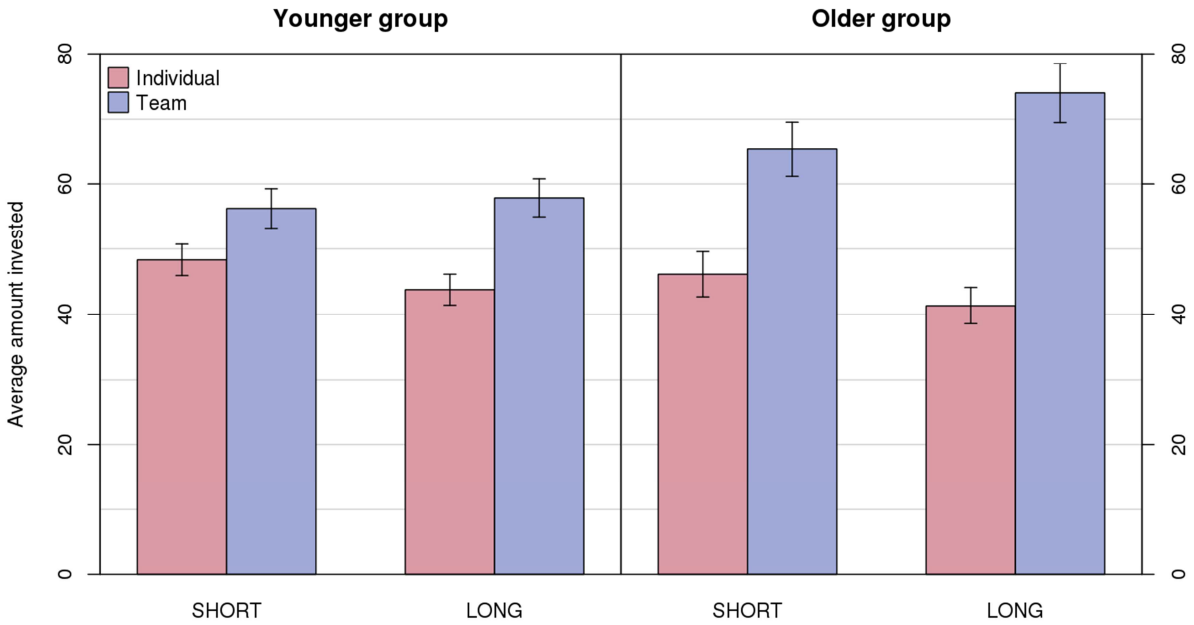
Notes: ***, ** and * denote significance at the 1%, 5%, 10% level; standard errors in parentheses. All inference is adjusted by using Beck and Katz (1995) panel-corrected standard errors.

Table 3: OLS regression on invested amounts. Results for 570 players (i.e., individuals or teams) and for rounds 1 through 9 and rounds 1, 4 and 7 for players in the SHORT and LONG treatment, respectively.

Explanatory variables	Dependent variable Invested amount		
	(1)	(2)	(3)
Team	6.885*	6.855*	10.020**
	(3.648)	(3.650)	(4.478)
Older group (grades 10 and 12)	-80.885**	-81.906**	-81.043**
	(34.627)	(34.641)	(34.663)
(at least) one male	10.047***	9.972***	10.201***
	(2.773)	(2.774)	(2.783)
(mean) age	0.527	0.429	0.454
	(1.513)	(1.516)	(1.516)
Team*older group	11.260**	11.212**	10.668*
	(5.572)	(5.573)	(5.574)
Older group*(mean) age	4.538**	4.628**	4.574**
	(2.277)	(2.278)	(2.279)
Short-sighted dependency		-10.990***	-6.664***
		(1.328)	(1.610)
Long-sighted dependency		2.617***	2.368**
		(0.820)	(0.982)
Team*short-sighted dependency			-13.215***
			(2.809)
Team*long-sighted dependency			0.728
			(1.768)
Intercept	37.824*	38.657**	37.140*
	(19.318)	(19.321)	(19.344)

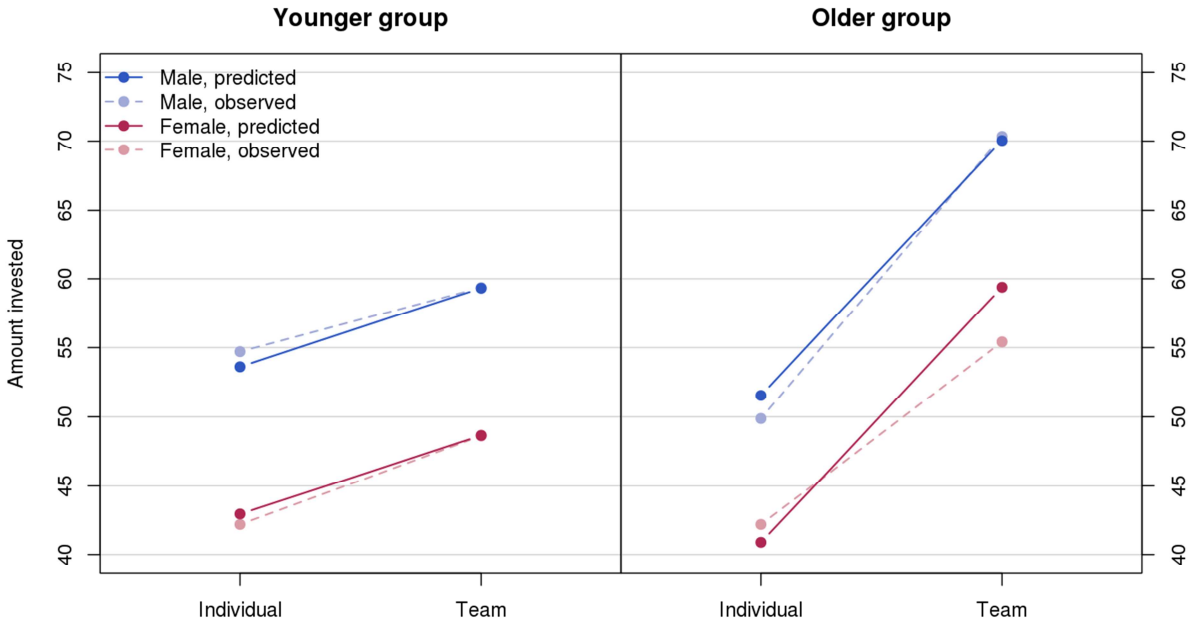
Notes: ***, ** and * denote significance at the 1%, 5%, 10% level; standard errors in parentheses. All inference is adjusted by using Beck and Katz (1995) panel-corrected standard errors.

Figure 1: Average invested amount across treatments (averaged over all nine rounds)



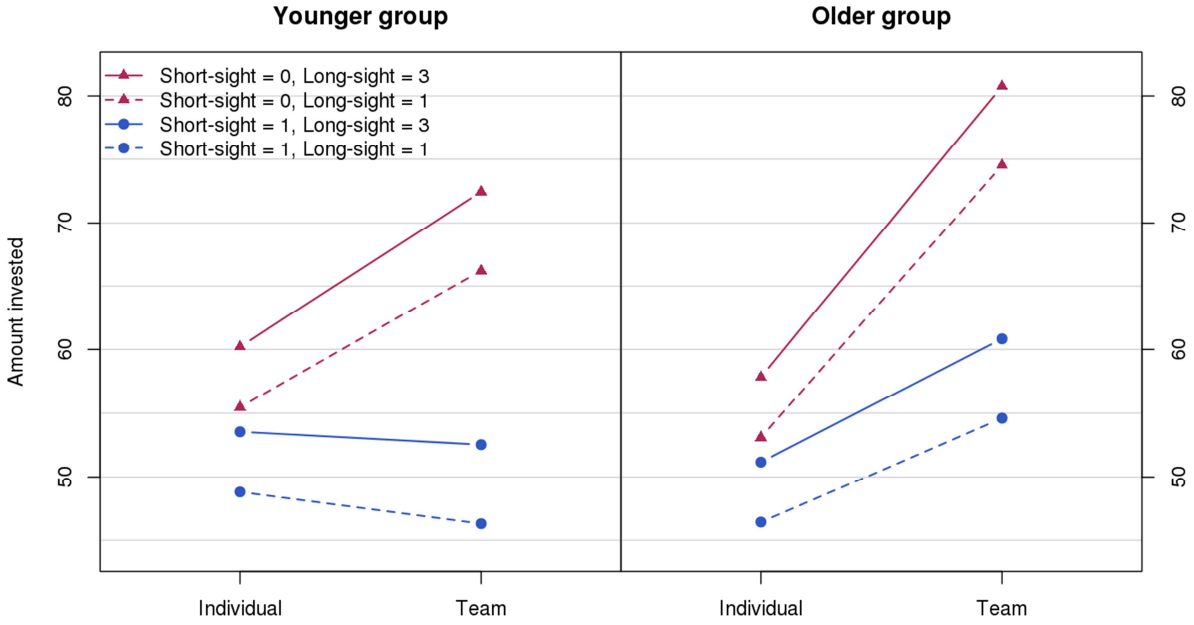
Younger group includes 6th and 8th graders; older group includes 10th and 12th graders.

Figure 2: Predicted and observed values of the invested amount across individual/team, younger/older group and male/female (predicted values are evaluated at average observed age and observed values are averaged over observed age) (values are taken from model 2 of Table 2)



Younger group includes 6th and 8th graders; older group includes 10th and 12th graders.

Figure 3: Predicted values of the invested amount across single/team, younger/older group and different levels of “short-sighted dependency” and ”long-sighted dependency” (predicted values are evaluated at average age; for teams with (at least) one male player) (values are taken from model 3 of Table 3)



Appendix

Experimental Instructions

Procedures:

The experiments were run in October 2008 in four grammar schools in Innsbruck and Schwaz, two cities located in the Federal State of Tyrol, Austria. Each session lasted approximately 50 minutes, including the completion of a post-experimental questionnaire and the distribution of the earned money. Therefore, subjects were called one by one to a separate room to receive their payment.

Note that all sessions within a particular school were run at the same day.

In order to guarantee anonymity, we used partition walls and did not allow any kind of conversation among students. Instructions were memorized by the experimenter and orally presented in class at the beginning of each session. Periodically the instructor paused and let the subjects raise their hands for questions which were then answered privately. An English translation of orally presented instructions is presented below.

Instructions for the younger age group and treatment LONG. *(We add in italics instructions for teams).* Instructions for the older age group and treatment SHORT are changed accordingly.

Welcome to our game. Before we start, we will explain the rules of our game. From now on, please don't talk to your neighbor and listen carefully. You can earn money in this game. We will give you the money in cash at the end of this lesson. How much money you will earn depends mainly on your decisions. That's why it is important that you understand the rules of our game. Please listen carefully now. We will frequently stop during our explanation and allow you to ask questions. Therefore, please raise your hand and one of us will come to you to answer your question. *(You will play this game in teams of 2 people. Each one of you may draw a card with a number from this bag. Each number is represented twice in this bag. The two persons with the same number form a team.)*

Everybody ok so far? *Leave time for questions and answer them privately.*

The game consists of 9 rounds. In each round you receive an endowment of 100 points *(per person).* 10 points are equal to 5 Cents. Who can tell me how much you get for 100 points? Correct, 50 Cents. You will have to decide *(together)* in each of the rounds, how many points of your endowment (from 0 to 100 points *(per person)*) you want to invest into the following lottery.

Everybody ok so far? *Leave time for questions and answer them privately.*

If you invest the amount X into the lottery, then, with a probability of 1/3, you will win 2.5 times the amount that you have invested into the lottery. Your earnings consequently equal to: 100+2.5*X *(per person)*.

With a probability of 2/3 you will lose the amount which you have invested into the lottery. Your earnings consequently equal to: 100-X *(per person)*.

Everybody ok so far? *Leave time for questions and answer them privately.*

You can imagine this lottery as if we had 10 orange and 20 white balls in a bag. If we randomly pick an orange ball from this bag, then you will win 2.5 times the invested amount, if we randomly pick a white ball from this bag, then you will lose your invested amount.

Everybody ok so far? *Leave time for questions and answer them privately.*

At the beginning of the 1st, 4th and 7th round you will have to type into the computer which amount you want to invest into the lottery in each of the following 3 rounds. The computer will then determine randomly for each of the 3 rounds separately, whether you win or lose the lottery. In each of the rounds you will win the lottery with a probability of 1/3 and you will lose the lottery with a probability of 2/3. This will then result in 3 outcomes. Thereafter, you will have to decide how much you want to invest in round 4 to 6 into the lottery and you will have to type this amount into the computer, et cetera. To calculate your payoff at the end of the game we will add your earnings over all rounds.

Everybody ok so far? *Leave time for questions and answer them privately.*

Please note, that you cannot invest your earnings from earlier rounds into the lottery. This means that your investment can equal to at most 100 points in each round. *(You will have to decide together. It is not possible to enter 2 different amounts.)*

University of Innsbruck - Working Papers in Economics and Statistics
Recent Papers can be accessed on the following webpage:

http://eeecon.uibk.ac.at/wopec/

2013-07 **Daniela Glätzle-Rützler, Matthias Sutter, Achim Zeileis:** No myopic loss aversion in adolescents? An experimental note

2013-06 **Conrad Kobel, Engelbert Theurl:** Hospital specialisation within a DRG-Framework: The Austrian case

2013-05 **Martin Halla, Mario Lackner, Johann Scharler:** Does the welfare state destroy the family? Evidence from OECD member countries

2013-04 **Thomas Stöckl, Jürgen Huber, Michael Kirchler, Florian Lindner:** Hot hand belief and gambler's fallacy in teams: Evidence from investment experiments

2013-03 **Wolfgang Luhan, Johann Scharler:** Monetary policy, inflation illusion and the Taylor principle: An experimental study

2013-02 **Esther Blanco, Maria Claudia Lopez, James M. Walker:** Tensions between the resource damage and the private benefits of appropriation in the commons

2013-01 **Jakob W. Messner, Achim Zeileis, Jochen Broecker, Georg J. Mayr:** Improved probabilistic wind power forecasts with an inverse power curve transformation and censored regression

2012-27 **Achim Zeileis, Nikolaus Umlauf, Friedrich Leisch:** Flexible generation of e-learning exams in R: Moodle quizzes, OLAT assessments, and beyond

2012-26 **Francisco Campos-Ortiz, Louis Putterman, T.K. Ahn, Loukas Balafoutas, Mongoljin Batsaikhan, Matthias Sutter:** Security of property as a public good: Institutions, socio-political environment and experimental behavior in five countries

2012-25 **Esther Blanco, Maria Claudia Lopez, James M. Walker:** Appropriation in the commons: variations in the opportunity costs of conservation

2012-24 **Edgar C. Merkle, Jinyan Fan, Achim Zeileis:** Testing for measurement invariance with respect to an ordinal variable

2012-23 **Lukas Schrott, Martin Gächter, Engelbert Theurl:** Regional development in advanced countries: A within-country application of the Human Development Index for Austria

2012-22 **Glenn Dutcher, Krista Jabs Saral:** Does team telecommuting affect productivity? An experiment

2012-21 **Thomas Windberger, Jesus Crespo Cuaresma, Janette Walde:** Dirty floating and monetary independence in Central and Eastern Europe - The role of structural breaks

2012-20 **Martin Wagner, Achim Zeileis:** Heterogeneity of regional growth in the European Union

2012-19 **Natalia Montinari, Antonio Nicolo, Regine Oexl:** Mediocrity and induced reciprocity

2012-18 **Esther Blanco, Javier Lozano:** Evolutionary success and failure of wildlife conservancy programs

2012-17 **Ronald Peeters, Marc Vorsatz, Markus Walzl:** Beliefs and truth-telling: A laboratory experiment

2012-16 **Alexander Sebald, Markus Walzl:** Optimal contracts based on subjective evaluations and reciprocity

2012-15 **Alexander Sebald, Markus Walzl:** Subjective performance evaluations and reciprocity in principal-agent relations

2012-14 **Elisabeth Christen:** Time zones matter: The impact of distance and time zones on services trade

2012-13 **Elisabeth Christen, Joseph Francois, Bernard Hoekman:** CGE modeling of market access in services

2012-12 **Loukas Balafoutas, Nikos Nikiforakis:** Norm enforcement in the city: A natural field experiment *forthcoming in European Economic Review*

2012-11 **Dominik Erharter:** Credence goods markets, distributional preferences and the role of institutions

2012-10 **Nikolaus Umlauf, Daniel Adler, Thomas Kneib, Stefan Lang, Achim Zeileis:** Structured additive regression models: An R interface to BayesX

2012-09 **Achim Zeileis, Christoph Leitner, Kurt Hornik:** History repeating: Spain beats Germany in the EURO 2012 Final

2012-08 **Loukas Balafoutas, Glenn Dutcher, Florian Lindner, Dmitry Ryvkin:** To reward the best or to punish the worst? A comparison of two tournament mechanisms with heterogeneous agents

2012-07 **Stefan Lang, Nikolaus Umlauf, Peter Wechselberger, Kenneth Harttgen, Thomas Kneib:** Multilevel structured additive regression

2012-06 **Elisabeth Waldmann, Thomas Kneib, Yu Ryan Yu, Stefan Lang:** Bayesian semiparametric additive quantile regression

2012-05 **Eric Mayer, Sebastian Rueth, Johann Scharler:** Government debt, inflation dynamics and the transmission of fiscal policy shocks

2012-04 **Markus Leibrecht, Johann Scharler:** Government size and business cycle volatility; How important are credit constraints?

2012-03 **Uwe Dulleck, David Johnston, Rudolf Kerschbamer, Matthias Sutter:** The good, the bad and the naive: Do fair prices signal good types or do they induce good behaviour?

2012-02 **Martin G. Kocher, Wolfgang J. Luhan, Matthias Sutter:** Testing a forgotten aspect of Akerlof's gift exchange hypothesis: Relational contracts with individual and uniform wages

2012-01 **Loukas Balafoutas, Florian Lindner, Matthias Sutter:** Sabotage in tournaments: Evidence from a natural experiment *forthcoming in Kyklos*

University of Innsbruck

Working Papers in Economics and Statistics

2013-07

Daniela Glätzle-Rützler, Matthias Sutter, Achim Zeileis

No myopic loss aversion in adolescents? An experimental note

Abstract
Myopic loss aversion (MLA) has been found to play a persistent role for investment behavior under risk. We study whether MLA is already present during adolescence. Quite surprisingly, we find no evidence of MLA in a sample of 755 adolescents. This finding is at odds with previous findings, and it might be explained by self-selection effects. In other dimensions, however, we are able to replicate stylized findings in our pool of adolescents, such that teams invest higher amounts than individuals and that women invest less than men.

ISSN 1993-4378 (Print)
ISSN 1993-6885 (Online)