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OVERCONFIDENCE, OMENS AND EMOTIONS: RESULTS FROM A FIELD EXPERIMENT

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Overconfidence, Omens and Emotions:

Results from a Field Experiment

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We analyze how overconfidence is affected by superstitious beliefs and emotions induced by positive and negative stimuli in a field experiment involving about 700 Italian students who were randomly assigned to numbered seats in their written examination sessions. According to widespread superstitions, some numbers are considered lucky, while others are considered unlucky. At the end of the examination, we asked students the grade they expected to get. We find that students tend to be systematically overconfident and that their overconfidence is positively affected by being assigned to a lucky number. Interestingly, males and females react differently: on the one hand, females tend to expect lower grades when assigned to unlucky numbers, while they are not affected by being assigned to lucky numbers. On the other hand, males are not affected by being assigned to unlucky numbers but expect higher grades when assigned to lucky numbers.

Keywords: Expectations; Grade; Overconfidence; Emotions; Superstition

JEL classifications: D01;D83; D03

1. Introduction

Psychological studies, surveys and laboratory experiments show that human beings are characterized by overconfidence: they tend to overestimate their ability, their knowledge and the precision of their information (Della Vigna, 2009).

Existing literature features two types of overconfidence: "absolute overconfidence" or "stand-alone overconfidence", a form of self-evaluation in absolute terms (Yates et al., 2002) and "relative" or "referential" overconfidence, when it requires comparison with others (Alicke et al., 1995; Glaser and Weber, 2007). Examples of absolute overconfidence are the excessive expectation about self-control ability found in the choice of health club contracts (Della Vigna and Malmendier, 2006), the

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wrong prediction of the time needed to complete a task and the overestimation of the accuracy of own information (Buehler et al., 1994; Newby-Clark et al., 2000). As regards relative overconfidence, Svenson (1981) shows that subjects perceive their driving skills higher than the average driver, while Camerer and Lovallo (1999) provide evidence on the overestimation of one's own ability to start a business relative to others.

Overconfidence occurs with varying intensity depending on gender, with males being more overconfident than females, is negatively correlated with age and abilities and depends on the type of task carried out (Barber and Odean, 2001; Bengtsson et al., 2005; Niederle and Vesterlund, 2007). Overconfidence comes out in many professional fields: Cooper et al. (1988) study entrepreneurs and their excessive optimism; Bauman et al. (1991) investigate overconfidence among physicians and nurses; Malmendier and Tate (2005, 2008) show how CEOs overestimate their ability to manage a company; Kent et al. (1998) consider investors' overconfidence about the precision of their private information; Menkhoff et al. (2006), studying the effects of experience for fund managers, find that inexperienced fund managers yield higher return because they have a higher degree of overconfidence that makes them more willing to risk, confident that they can beat the odds; similar results are shown by Camerer and Lovallo (1999) that explain the high rate of business failure in relation to overconfidence, which leads to excess entry.

Since overconfidence represents a deviation from the traditional economic paradigm – which assumes that individuals are on average correct about the distribution of the states – it could happen that overconfidence itself, like human behavior in general, is influenced by emotions. Good and bad mood seem to affect individual attitudes towards reciprocity (Kirchsteiger et al. 2006), time and risk preferences (Drichoutis and Nayga, 2010), bidding (Capra et al., 2010) and perceived probabilities (Fehr-Duda et al., 2011). The influence of positive and negative emotions on overconfidence has been documented by Ifcher and Zarghamee (2011a, 2011b), who find that both positive and negative affects significantly increase overconfidence in a laboratory experiment.

In our work we analyze if overconfidence exists and how overconfidence is affected by emotions induced by positive and negative stimuli related to superstitious beliefs. At this aim we have conducted a field experiment involving about 700 students enrolled at a middle sized Italian public University and attending four different economics classes in the academic years 2010-2011 and 2011-2012. During the examination sessions each student was randomly assigned to a numbered seat and was given a corresponding numbered examination form.

Our investigation strategy relies on the fact that according to superstitious beliefs, still widespread in Italy, some numbers are considered lucky, while others are considered unlucky (see, among others, Schimmel, 1994; Warning, 2009; Hiller, 2012). Therefore, the randomly assigned number at the examination session represents an emotional stimulus for superstition-prone individuals.

Superstitions seem to be relevant for individual behaviors and are then expected to affect individual feelings. For example, O'Reilly and Stevenson (2000) show that in Northern Ireland

patients prefer delaying the day of discharge from maternity units to avoid the bad luck of Saturdays; Lewis and Gallagher (2001) study the unwillingness of college students of taking a test on "Friday the Thirteenth". Similarly, Kolb and Rodriguez (1987) investigate the effects of superstition on financial markets showing lower mean returns for "Friday the Thirteenth". The beliefs in "lucky" and "unlucky" numbers have been found to have effects on the prices of houses (Bourassa and Peng, 1999), on the prices of vehicle license plates in China (Woo and Kwok, 1994; Woo et al., 2008; Ng et al., 2010) and on the timing of babies' birth year (Wong and Yung, 2005).

In our experiment, seats and examination forms were numbered from 1 to 30 and randomly assigned to students taking the exam. In the Italian popular culture the number 17 is considered unlucky; on the other hand, the number 13 is thought to be a lucky number (in contrast to the Anglo-Saxon tradition). In addition, in the context of college students, the number 30 (corresponding to the maximum grade that students may obtain at an exam) is considered a lucky number. As a consequence, we consider students assigned to the seats and examination forms numbered 17 as exposed to a negative stimulus (which we call *Bad Omen*), while students assigned to seats 13 and 30 are subject to a positive stimulus (*Good Omen*). These represent our two treatment groups. All the other students assigned to the remaining numbered seats constitute our control group. In order to avoid to influence students' perceptions, we explained them that the numbered seats and examination forms were a strategy undertaken to avoid plagiarism.

With respect to existing works in the literature that study individual reactions by inducing positive and negative feelings via audio-video stimuli, we have decided to rely on the experimental design described above because the simple assignment of students to numbered seats with lucky and unlucky numbers in the context of a real life situation (a university examination) should be perceived as less artificial and then be less affected by biases arising from a laboratory setting and from the fact that individuals are aware of being involved in an experiment ("Hawthorne" and "John Henry" effects).

Once students had accomplished their exam, we asked them to answer a short survey including questions about their expectations of the grade they will obtain at the exam and about the average grade they expect the other students undertaking the same examination will obtain. We matched these information with the effective outcome of the exam and with administrative data on student's gender, academic abilities and family background.

From our analysis it emerges that students are typically overconfident, in that they expect higher grades than those effectively obtained. Moreover, they expect to perform better than their peers. More importantly, we find that absolute and relative overconfidence are positively affected by the *Good Omen* and negatively affected by the *Bad Omen* (the latter effect has weaker statistically significance).

In line with the existing literature on gender differences in attitudes, we find that females tend to be less overconfident than males, although the gender effect is imprecisely estimated. Interestingly, we find that males and females react differently to the positive and negative treatment. On the one hand,

females tend to expect lower grades when assigned to the unlucky numbers, while they do not seem to react to the positive emotions induced by the lucky numbers. On the other hand, we find that males are not affected by the negative treatment but expect higher grades when assigned to the lucky numbers. Consistently with other findings on male-female differences (Croson and Gneezy, 2009; Bertrand, 2010), our results suggest that not only females tend to be less confident than males, but they are more susceptible to negative emotions while males tend to ignore negative stimuli and are instead affected by positive stimuli.

The paper is organized as follows. In Section 2 the design of the experiment is explained and some descriptive statistics are provided. Section 3 investigates the effects of the positive and negative emotions related to superstition on overconfidence and relative overconfidence. In Section 4 we analyze heterogeneous effects according to gender. Section 5 offers some robustness checks. Section 6 examines if the effective performance is also affected by superstitious beliefs. Section 7 concludes.

2. Experiment Description and Data

The experiment we conducted has involved 719 students enrolled at the classes of Microeconomics, Macroeconomics, Personnel Economics and Econometrics offered by the First Level Degree Course in Business and Administration at the University of Calabria in the academic years 2010-2011 and 2011-2012.[1]

The aim of the experiment is to understand whether negative and positive feelings evoked by superstitions affect students' expectations. Our investigation strategy relies on the fact that the Italian popular culture is still characterized by superstitious beliefs, that have been passed down for generations, especially in the South.

According to the Italian culture the number 17 is unlucky (Warning, 2009; Hiller, 2012). Since Italians consider 17 as a bad omen you do not find a 17^{th} row in a theatre or in a cinema or a seat with the number 17. Some Alitalia planes have no row 17 and Renault sold its "R17" model in Italy as "R177".[2] On the other hand, while the number 13 is considered unlucky in many countries, in Italy it is considered to be a lucky number. A "13" in the popular football pool "Totocalcio" is the equivalent of the big prize. In the South of Italy, until recently, talismans with the number 13 were very diffuse. Finally, in the context of college students, the number 30 is also considered as a good omen since it is

[1] The University of Calabria is a middle-sized public university located in the South of Italy. It has currently about 35,000 students enrolled in different Degree Courses and at different levels of the Italian University system. Since the 2001 reform, the Italian University system is organized around three main levels: First Level Degrees (3 years of legal duration), Second Level Degrees (2 years more) and Ph.D. Degrees. In order to gain a First Level Degree students have to acquire a total of 180 credits. Students who have acquired a First Level Degree can undertake a Second Level Degree (acquiring 120 more credits). After having accomplished their Second Level Degree, students can enroll in a Ph.D. degree.

[2] The 17^{th} curve at the Cesana bobsled run at 2006's Winter Olympics in Turin was "Senza Nome" (i.e. "Without a name").

the maximum grade students can obtain at a university exam.

Given these superstitions we expect that the students who are exposed to the number 17 experiment negative feelings, while the students exposed to the number 13 or to the number 30 experiment positive feelings.

Typically in the Italian system, during an examination session students do not have a pre-assigned numbered seat: before the exam starts they are called individually (usually in alphabetic order) and they take the first available seat.

In order to study whether superstitions related to lucky or unlucky numbers affect students' expectations, before students were admitted to the classroom in which the written exams took place, we numbered the seats in each row of a large classroom from 1 to 30. For logistic reasons and for leaving some distance among students we only used 15 numbered seats and left unfilled the other 15 in each row. Then, we randomly assigned students to these seats.

More precisely, on the basis of the available administrative information on students' characteristics, we proceeded to the stratification of students sitting each exam according to the high school grade (three categories). For each group of 15 students, we randomly assigned one student to seat 17 (*Bad Omen*), one student to seat 13 and one student to seat 30 (*Good Omen*).[3] The remaining students were randomly assigned to the other numbered seats.

As a result of this procedure, we end up with a control group of 550 students (76.5%) that is much larger compared to the two treatment groups, respectively 61 (8.5%) for the *Bad Omen* and 108 students (15.2%) for the *Good Omen*.[4]

At the beginning of the examination session, we called students individually and made them aware of the number of the seat assigned to them. Moreover, to reinforce the negative and positive stimuli, students received an examination form with the same number printed on it (i.e. the student sitting at the seat 3 has the exam numbered 3). Students were told that this procedure was necessary in order to check whether they were cheating during the examination, copying their answers from their peers. To avoid to influence their reactions, they were not told to be involved in an experiment.

The classes involved in the experiment were taught to students during the second semester (teaching period from March to June) of two academic years (2010-2011and 2011-2012). As the treatment and the control status was assigned only at the moment in which students took their exam, treated and control students attended the classes in the same room, at the same time and with the same instructor and teaching material. At the end of the teaching period, in July, students were required to undertake the exam for the respective class (in two sessions). Examinations were based on multiple

[3] When the number of students included in each stratified group was not a multiple of 15, each of the remaining students were simply assigned with a probability of 1/15 to each of the treated groups and with a probability of 12/15 to the control group.

[4] On the whole, about 300 students who were supposed to take the exam were absent from the examinations. Since students did not know the seat assigned to them before the examination, absent students were independent from the treatment status and no sample selection problem arises.

choice tests.

At the end of the exam, students were required to fill a short survey aiming at measuring their expectations regarding the outcome at the exam. More precisely, students were required to answer the following two questions: 1) "What grade do you expect to get at this exam?"; 2) "What grade do you expect that the other students will get on average at this exam?". For both questions respondents could select a grade ranging from 0 to 30 cum laude, which we consider equal to 31.[5] We reassured students that we were not going to look at their expected grades before examinations were graded announcing that we would have put their answers in a closed envelope signed by two of them and that the envelope would have been opened at the presence of students after the whole process of examination was over.

We use the answers of students to derive two measures of students' expectations. The answers to the first question allow us to build the variable *Expected Grade*; the difference between this expectation and the average grade the student expects to be obtained by his/her peers gives us an indication of the student's *Relative Expected Grade*.

Furthermore, we create both a measure of absolute overconfidence, *Overconfidence*, computed as the difference between student's *Expected Grade* and the actual grade s/he gets at the exam (*Grade*) and a measure of *Relative Overconfidence*, computed as the difference between the student's relative expectation and his/her relative performance (that is, *Relative Overconfidence=Relative Expected Grade–*(*Grade–Average Grade*), where the *Average Grade* is the average grade obtained by all the students sitting the same exam in the same session).

Table 1 provides descriptive statistics for our sample of students. 42% of students have undertaken the Microeconomics exam, 15% Macroeconomics, 37% Personnel Economics and 6% Econometrics. About 59% of students are females. High School Grade ranges from 60 (the minimum passing grade) to 100 (the maximum grade), with a mean of 88.9. Students come from Technical Schools (54%) and Lyceums (about 46%). The variable *Regular* shows that about 77% of sample students are regularly enrolled, while the remaining 23% have not passed all the exams that they were supposed to pass, thus being late in their academic career. The exams were undertaken in two academic years and in two sessions per year. The average number of years of education for parents ranges from 3 to 18, with a mean of 11.32.[6]

We observe grades both in passed examinations (18-31) and in failed examinations (grades below 18); the effective *Grade* students obtain on average is 18.03. The mean *Expected Grade* is 20.72. Students have a strong positive level of *Overconfidence*: they expect to pass the exam with a

[5] *Expected Grade* was an integer, whereas the grade expected for others was with one decimal place.

[6] We do not have information about the age of students. However this is not a major concern for our analysis because the variable *Regular* catches the effect of student's age. In fact, students that are regularly enrolled have almost the same age while students that are late in their academic career are typically older. Moreover, people that decide to enroll at university some years after the end of High School studies (thus having an age different from that of regular students) represent only few cases in the university we consider.

grade that is on average 2.687 points higher than the effective one. The median value of *Overconfidence* is 2; about 60% of students (427/719) expect a grade higher than their effective grade.

Table 1. Descriptive Statistics

Variables	Obs	Mean	Std. Dev.	Min	Max
Expected Grade	719	20.720	6.304	0	31
Grade	719	18.033	8.602	0	31
Overconfidence	719	2.687	6.035	-22.5	27
Relative Expected Grade	719	1.672	6.259	-20.2	13.3
Relative Overconfidence	719	1.672	6.133	-24.179	23.723
Bad Omen	719	0.085	0.279	0	1
Good Omen	719	0.150	0.358	0	1
Female	719	0.592	0.492	0	1
High School Grade	719	88.982	9.068	60	100
Lyceum	719	0.458	0.499	0	1
Regular	719	0.772	0.420	0	1
Parents' Education (avg.)	719	11.322	3.383	3	18
Microeconomics	719	0.423	0.494	0	1
Macroeconomics	719	0.152	0.359	0	1
Personnel Ec.	719	0.367	0.482	0	1
Econometrics	719	0.058	0.235	0	1
First Session	719	0.444	0.497	0	1
Year: 2010-2011	719	0.654	0.476	0	1

Notes: Grades in each class ranges from 18 to "30 cum laude" (set equal to 31). High School Grade ranges from 60 to 100.

Students feel overconfident also with respect to their peers. *Relative Expected Grade* shows that students on average expect to perform about 1.67 points better compared to what they expect for their peers. About 71% of students (519/719) expect to perform better than their peers. The level of *Relative Overconfidence* is 1.67.[7]

We firstly verify if the randomization has been successful. In the first three columns of Table 2, means for a number of individual characteristics are reported by treatment groups. Differences in means between *Good Omen* and Control, and *Bad Omen* and Control are reported in columns 4 and 5 respectively (standard errors are reported in parentheses). In column 6 we report the *F*-stat (and *p*-value) for a test of equality of variables' means across all three groups.

Results show that the randomization was successful in creating comparable treatment and control groups as regards the observable characteristics: there are no significant differences between the treatment status in terms of students' gender, High School Grade, type of High School attended, parents' education and class attended.

[7] Given how Relative Overconfidence is built, the mean of Relative Overconfidence coincides with the mean of Relative Expected Grade.

Table 2. Student characteristics across treatment and control groups

	Means			Differences (s.e.)		
	Good Omen	*Bad Omen*	Control	Good Omen v. Control	Bad Omen v. Control	*F*-stat (*p*-value)
Female	0.602	0.492	0.602	-0.000	-0.110	1.399
				(0.051)	(0.068)	(0.248)
High School Grade	87.815	87.705	89.353	-1.537	-1.648	1.965
				(0.981)	(1.294)	(0.141)
Lyceum	0.398	0.459	0.469	-0.071	-0.010	0.914
				(0.052)	(0.068)	(0.402)
Parents' Education	11.060	11.303	11.375	-0.315	-0.072	0.390
				(0.356)	(0.457)	(0.676)
Regular	0.759	0.787	0.773	-0.013	-0.014	0.088
				(0.045)	(0.055)	(0.915)
Microeconomics	0.481	0.393	0.414	0.067	-0.021	0.945
				(0.053)	(0.066)	(0.389)
Macroeconomics	0.157	0.147	0.152	0.006	-0.003	0.019
				(0.038)	(0.048)	(0.981)
Personnel economics	0.287	0.393	0.380	-0.093	-0.013	1.779
				(0.049)	(0.066)	(0.170)
Econometrics	0.074	0.065	0.055	0.019	0.011	0.343
				(0.027)	(0.033)	(0.709)
Observations	108	61	550			

Notes: Standard errors are reported in parentheses. In the last column we report the *F*-stat and *p*-value for a test of equality of variables' means across all three groups.

3. Grade Expectations, Overconfidence and Good and Bad Omens

3.1. Expected Grade and Absolute Overconfidence

A large psychological literature shows that people tend to bias their judgments by overestimating their skills, the precision of their information and their self-control abilities. Such a behavior represents a deviation from the perfect rationality assumption and, therefore, it is quite reasonable to assume that it is influenced by emotions, superstitions and moods.

In this section we investigate whether students' superstitions and their exposition to emotional stimuli in the form of seats' numbers associated with positive or negative omen does affect their expectations and their level of overconfidence. We estimate the following linear regression model:

$$Expected\_Grade_i = \beta_0 + \beta_1 Good\_Omen_i + \beta_2 Bad\_Omen_i + \beta_3 Grade_i + \beta_4 X_i + \beta_5 Z_i + \varepsilon_i$$

where *Expected Grade* is the dependent variable of the model; *Grade* is the effective grade students obtain; *Good Omen* and *Bad Omen* are the two dummies for treatment status as described in Section 2, *X* denotes the vector of student's predetermined characteristics, cognitive ability, and family

background and *Z* denotes the vector of additional control variables (dummies for class attended, examination session and academic year in which the student took the exam); ε is an error term.

Furthermore, we estimate a similar model to analyze directly if overconfidence is affected by superstitions and emotions:

$$Overconfidence_i = \phi_0 + \phi_1 Good\_Omen_i + \phi_2 Bad\_Omen_i + \phi_4 \mathrm{X}_i + \phi_5 Z_i + v_i$$

We start by focusing our attention on student's expectations and absolute overconfidence to investigate whether being in a positive or negative mood during the exam influences students' capacity to estimate their ability and their knowledge. In the next section we turn our attention towards relative overconfidence and question whether students' emotions affect also the relative judgment of their own ability.

Table 3 reports the estimation results of an OLS model in which we investigate whether being exposed to *Good Omen* and to *Bad Omen* influences expectations concerning the grade obtained at the exam. The dependent variable is the *Expected Grade*, but as we include among controls the effective grade obtained at the exams, our estimations indirectly describe the determinants of the gap between expected and effective performance. In columns (1), (2) and (3) we jointly consider the two lucky numbers (13 and 30) defining the *Good Omen*, while in columns (4), (5) and (6) the same specifications are reported by splitting the *Good Omen* in its two components, *Thirty* and *Thirteen*.

In the first specification (columns 1 and 4) we only control for the grade obtained at the exam, the class attended by the students, the academic year and the examination session in which they took the exam (not reported). We find a strong positive impact for the *Good Omen* (statistically significant at the 1 percent level): students receiving the good omen expect to have 1.09 points more than control students. On the other hand, the coefficient of *Bad Omen* is negative but far from being statistically significant. The effective *Grade* is a strong determinant of the expected grade: the higher the grade a student actually obtained at the exam, the higher the grade s/he was expecting to get at the end of the exam. The coefficient is 0.521 and *t*-stat is 19.56, suggesting that students have tried to answer sincerely to our questions on grade expectations.

In the specification in which we split the *Good Omen* in its two components (column 4), both the two lucky numbers have a positive effect: the coefficient on *Thirty* is positive (1.18) and significant at the 5% level, while that on *Thirteen* is positive (1.01) and significant at the 10% level.

In the second specification (columns 2 and 5) we add among controls student's gender and measures of individual ability – represented by the variables *Lyceum*, *High School Grade* and *Regular*. We find that the exposition to a positive stimulus is an important driver of the formation of student's expectations also when we control for his/her individual ability. The positive relationship between the *Good Omen* and the expected grade at the exam remains statistically significant in both columns. The coefficient of the *Bad Omen* remains negative but not statistically significant.

Finally, in the third specification (columns 3 and 6) we include controls for family background (parents' average years of education).[8] Also in this specification the relationship between the *Good Omen* and the expected grade remains positive and statistically significant: students exposed to a positive stimulus have an expected grade of about 1 point higher than students in the control group. Results do not change for the *Bad Omen*'s coefficient (not significant).

Table 3. Superstition, Emotional Stimuli and Students' Grade Expectations: OLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Grade	0.5214***	0.5424***	0.5424***	0.5212***	0.5423***	0.5423***
	(0.0267)	(0.0282)	(0.0282)	(0.0267)	(0.0283)	(0.0283)
Bad Omen	-0.3768	-0.5637	-0.5676	-0.3763	-0.5628	-0.5667
	(0.6225)	(0.6172)	(0.6173)	(0.6230)	(0.6178)	(0.6179)
Good Omen	1.0940***	1.0319***	1.0299***			
	(0.3930)	(0.3852)	(0.3845)			
Female		-0.3536	-0.3788		-0.3494	-0.3749
		(0.3486)	(0.3458)		(0.3533)	(0.3508)
Regular		0.9625**	0.9779**		0.9670**	0.9819**
		(0.4652)	(0.4681)		(0.4661)	(0.4689)
High School Grade		-0.0564***	-0.0565***		-0.0564***	-0.0564***
		(0.0204)	(0.0204)		(0.0204)	(0.0204)
Lyceum		-0.4131	-0.3683		-0.4138	-0.3693
		(0.3392)	(0.3510)		(0.3398)	(0.3521)
Parents' Education (avg.)			-0.0216			-0.0214
			(0.0523)			(0.0524)
Good Omen: Thirty				1.1848**	1.0919**	1.0846**
				(0.5058)	(0.5001)	(0.4991)
Good Omen: Thirteen				1.0071*	0.9749*	0.9779*
				(0.5215)	(0.5201)	(0.5196)
Constant	10.7940***	14.9655***	15.1897***	10.8005***	14.9608***	15.1835***
	(0.8009)	(1.7858)	(1.8746)	(0.8029)	(1.7849)	(1.8727)
Observations	719	719	719	719	719	719
Adjusted R-squared	0.514	0.521	0.520	0.514	0.520	0.520

Notes: The dependent variable is *Expected Grade*. In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

As far as control variables are concerned, females expect lower grades, but the coefficient is not statistically significant at conventional levels. *High School Grade* and *Regular* seem to be two important determinants of the expected grade. Students that score a higher grade at High School tend to expect lower grades compared to students with a lower High School grade. Being a regularly enrolled student increases expected performance, probably because these students are younger compared to the reference category. It does not emerge a statistically significant effect for students' family background.

Table 4 presents the results of OLS estimates for the same specifications reported in Table 3, but considering as dependent variable the level of absolute *Overconfidence*, i.e. the difference between the *Expected Grade* and the effective *Grade* obtained at the exam by each student. In the specifications reported in Table 4 we do not control for *Grade* since it is used in the computation of students' overconfidence.

[8] Controlling also for the type of employment of parents does not change our results.

Preliminarily, regressing *Overconfidence* only on a constant, we verify that Overconfidence is statistically different from zero (*t*-stat=11.94): students systematically expect grades higher than their effective grades.

The results in Table 4, by and large, confirm the results shown in Table 3. Females appear to be less overconfident than males (however, the statistical significance of *Female* is rather low, *p*-value=0.22). Students with higher High School grade or coming from academic oriented schools (*Lyceums*) are significantly less overconfident. Regular students are instead more overconfident, may be because they are younger. Parents' education, once controlling for measures of students' academic abilities, does not seem to produce any effect on Overconfidence.

More importantly for the aims of our paper, from Table 4 it emerges a positive and statistically significant relationship between the *Good Omen* and students' overconfidence. The coefficient of *Good Omen* in the specification including all the control variables (column 3) shows that being exposed to a positive stimulus increases students absolute overconfidence by 1.14 points. From the estimates in column (6) it also emerges that students' overconfidence is mostly affected by the superstition linked to the number 13. On the other hand, being exposed to the *Bad Omen* exerts a negative effect on *Overconfidence*, although its statistical significance is not very high (*p*-value=0.11).

In a further specification (not reported), we also control for the effective *Grade*. The latter turns out to be strongly negatively correlated to *Overconfidence*: obviously, students performing better seem to have underestimated their performance and viceversa. As regards the effects of our interest, again we find that *Good Omen* has a positive impact and *Bad Omen* has a negative impact on *Overconfidence*.

Table 4. Emotional Stimuli and Students' Absolute Overconfidence: OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Bad Omen	-0.7865	-1.2456	-1.2503	-0.7877	-1.2500	-1.2550
	(0.7994)	(0.7780)	(0.7786)	(0.7999)	(0.7786)	(0.7792)
Good Omen	1.4992***	1.1435**	1.1409**			
	(0.5797)	(0.5415)	(0.5410)			
Female		-0.5187	-0.5496		-0.5457	-0.5787
		(0.4410)	(0.4488)		(0.4443)	(0.4523)
Regular		1.2030**	1.2219**		1.1726*	1.1919*
		(0.6060)	(0.6077)		(0.6071)	(0.6086)
High School Grade		-0.1871***	-0.1871***		-0.1872***	-0.1872***
		(0.0240)	(0.0240)		(0.0239)	(0.0239)
Lyceum		-1.3100***	-1.2551***		-1.3039***	-1.2460***
		(0.4223)	(0.4206)		(0.4223)	(0.4198)
Parents' Education (avg.)			-0.0264			-0.0277
			(0.0675)			(0.0676)
Good Omen: Thirty				1.1924	0.7465	0.7371
				(0.7272)	(0.6690)	(0.6683)
Good Omen: Thirteen				1.7923**	1.5204**	1.5241**
				(0.8056)	(0.7603)	(0.7592)
Constant	2.6845***	18.7128***	18.9866***	2.6718***	18.7363***	19.0250***
	(0.7964)	(2.2608)	(2.3848)	(0.7961)	(2.2552)	(2.3835)
Observations	719	719	719	719	719	719
Adjusted R-squared	0.043	0.124	0.123	0.042	0.124	0.123

Notes: The dependent variable is *Overconfidence*. In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

3.2. Relative Expected Grade and Relative Overconfidence

Usually, when people consider their achievements or their abilities, they not only think in absolute terms, but also use to compare their conditions with those of other individuals with whom they interact. In this section, we focus our attention on this aspect of human behavior in order to study whether students relative judgment is influenced by superstition, mood and emotions.

The estimates reported in Table 5 underline an effect of emotional stimuli on students' expected grade relative to the average grade that they expect to be obtained by the other students sitting the exam in the same session. Being in the *Good Omen* group is positively correlated with students' relative expectation. In particular, students that have a seat and an exam form with the number 30 expect to get a grade that is 1.13 points higher than the grade they expect their peers are going to obtain. Also in this case, the *Bad Omen* group does not present statistically significant differences in the relative expectations compared with the control group.

Table 5. Emotional Stimuli and Students' Relative Expected Grade: OLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Grade	0.5172***	0.5396***	0.5396***	0.5169***	0.5393***	0.5394***
	(0.0262)	(0.0278)	(0.0278)	(0.0263)	(0.0278)	(0.0278)
Bad Omen	-0.3070	-0.5137	-0.5198	-0.3060	-0.5120	-0.5181
	(0.6200)	(0.6109)	(0.6106)	(0.6205)	(0.6115)	(0.6112)
Good Omen	0.9525**	0.8664**	0.8632**			
	(0.3934)	(0.3809)	(0.3802)			
Female		-0.5391	-0.5782*		-0.5310	-0.5702
		(0.3484)	(0.3449)		(0.3531)	(0.3500)
Regular		0.7107	0.7346		0.7196	0.7426
		(0.4702)	(0.4736)		(0.4713)	(0.4745)
High School Grade		-0.0558***	-0.0558***		-0.0557***	-0.0557***
		(0.0205)	(0.0205)		(0.0205)	(0.0205)
Lyceum		-0.5827*	-0.5133		-0.5839*	-0.5153
		(0.3375)	(0.3489)		(0.3381)	(0.3502)
Parents' Education (avg)			-0.0333			-0.0330
			(0.0519)			(0.0520)
Good Omen: Thirty				1.1304**	0.9838*	0.9726*
				(0.5298)	(0.5168)	(0.5157)
Good Omen: Thirteen				0.7820	0.7547	0.7592
				(0.4969)	(0.4920)	(0.4911)
Constant	-8.1825***	-3.7374**	-3.3906*	-8.1698***	-3.7466**	-3.4031*
	(0.8046)	(1.8052)	(1.8883)	(0.8063)	(1.8052)	(1.8870)
Observations	719	719	719	719	719	719
Adjusted R-squared	0.506	0.514	0.513	0.506	0.513	0.513

Notes: The dependent variable is *Relative Expected Grade*. In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

In Table 6 we replicate the same estimates presented in Table 4 to investigate whether students' relative overconfidence is influenced by the treatments administered in our experiment. The effect of a positive stimulus on relative overconfidence is similar to the one on absolute Overconfidence. In the specification including all the control variables (column 3) the coefficient on *Good Omen* is 1.02, statistically significant at the 10% level, while when we split the *Good Omen* in

its two components, although still positive, only the coefficient on the number 13 is statistically significant. The impact of *Bad Omen* is negative (about -1.3) even if the statistical significance is not high (*p*-value around 0.11 in specifications with the whole set of our controls).

Table 6. Emotional stimuli and students' Relative Overconfidence: OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
Bad Omen	-0.8188	-1.2911	-1.2957	-0.8198	-1.2951	-1.2999
	(0.8168)	(0.7972)	(0.7976)	(0.8174)	(0.7977)	(0.7981)
Good Omen	1.4137**	1.0233*	1.0208*			
	(0.5971)	(0.5541)	(0.5539)			
Female		-0.6746	-0.7044		-0.6990	-0.7307
		(0.4470)	(0.4545)		(0.4505)	(0.4585)
Regular		0.7888	0.8070		0.7613	0.7799
		(0.6168)	(0.6195)		(0.6184)	(0.6208)
High School Grade		-0.1863***	-0.1863***		-0.1863***	-0.1864***
		(0.0247)	(0.0247)		(0.0246)	(0.0246)
Lyceum		-1.5033***	-1.4503***		-1.4978***	-1.4421***
		(0.4273)	(0.4313)		(0.4275)	(0.4310)
Parents' Education (avg.)			-0.0254			-0.0267
			(0.0685)			(0.0686)
Good Omen: Thirty				1.1779	0.6637	0.6547
				(0.7809)	(0.7102)	(0.7105)
Good Omen: Thirteen				1.6390**	1.3646*	1.3682*
				(0.8067)	(0.7653)	(0.7651)
Constant	0.5509	16.9687***	17.2327***	0.5411	16.9900***	17.2675***
	(0.8141)	(2.3425)	(2.4406)	(0.8144)	(2.3366)	(2.4385)
Observations	719	719	719	719	719	719
Adjusted R-squared	0.053	0.134	0.133	0.052	0.133	0.132

Notes: The dependent variable is *Relative Overconfidence*. In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

4. Heterogeneous Impact of Omens according to Gender

In this section we investigate whether the reactions of students in terms of overconfidence to the *Good Omen* and the *Bad Omen* differ according to gender.

In columns (1) and (2) of Table 7 we report OLS estimates obtained by re-estimating the specification in column (3) of Table 3, including all our controls, separately for females and males, respectively. It emerges that the impact of the *Bad Omen* is negative and statistically significant (the coefficient is -1.65, significant almost at the 5 percent level) only for females, while for males the coefficient on *Bad Omen* is far from being statistically significant. On the other hand, females do not react to the *Good Omen*, while males show a strong and highly statistically significant reaction (+2.13, significant at the 1 percent level).

In column (3), to investigate whether differences between males and females are statistically significant, we estimate our model on the whole sample including among regressors the dummy *Female* and two interaction terms between the treatments status and *Female*.

Both interaction terms are statistically significant, implying significant gender differences in overconfidence responses to emotions. We confirm that for males only *Good Omen* has a positive impact on the expected grade (+1.99; *t*-stat=3.11), while for females only *Bad Omen* has a negative impact (-1.63=0.55-2.18; *t*-stat=-1.80).

In columns (4), (5) and (6) we replicate specifications reported in columns (1), (2) and (3), but we consider as dependent variable *Overconfidence*. Also in this case we find that males and females react differently to the *Good Omen* and the *Bad Omen*: females react negatively to the *Bad Omen* while males react positively to the *Good Omen*.

Similar results are obtained when we split *Good Omen* considering the two different lucky numbers assigned to students (13 and 30). Both the two *Good Omen*s positively affect men's overconfidence, while no effect emerges for women. Again the *Bad Omen* affects exclusively women (results not reported).

These results are in line with gender differences in psychological reactions emerged in a number of other studies (Croson and Gneezy, 2009; Bertrand, 2010) finding, for example, that females report more intense stress and fear than males in anticipation of negative outcomes (Roberts and Nolen-Hoeksema, 1989; Fujita, Diener, Sandvik, 1991; Brody, 1993). Similarly, Loewenstein et al. (2001) show evidence of women's pessimism at the time of making a risky decision; Silverman and Kumka (1987), Flynn et al. (1994) and Spigner et al. (1993) suggest that pessimism may also cause women to overestimate the probability of negative outcomes.

Table 7. Heterogeneous Effects of Good and Bad Omens according to Gender: OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Expected Grade			Overconfidence		
	Females	Males	Whole	Females	Males	Whole
Grade	0.5212***	0.5859***	0.5426***			
	(0.0390)	(0.0416)	(0.0282)			
Bad Omen	-1.6547*	0.6222	0.5534	-2.0585**	-0.2589	-0.4582
	(0.8868)	(0.8158)	(0.8108)	(0.9144)	(1.1918)	(1.2003)
Good Omen	0.4590	2.1333***	1.9996***	0.2372	2.6475***	2.5425***
	(0.4871)	(0.7128)	(0.6433)	(0.7093)	(0.9206)	(0.8709)
Female			0.0688			-0.0460
			(0.4142)			(0.5298)
Regular	1.9433***	-0.3792	0.9801**	2.7698***	-0.6756	1.2097**
	(0.6505)	(0.6062)	(0.4634)	(0.7989)	(0.8702)	(0.6065)
High School Grade	-0.0703***	-0.0500	-0.0596***	-0.2264***	-0.1480***	-0.1913***
	(0.0257)	(0.0333)	(0.0203)	(0.0294)	(0.0400)	(0.0240)
Lyceum	-0.4191	-0.5107	-0.3726	-1.4978***	-1.0035	-1.2552***
	(0.4708)	(0.5576)	(0.3508)	(0.5446)	(0.6901)	(0.4195)
Parents' Education (avg.)	0.0164	-0.1127	-0.0221	0.0749	-0.2198*	-0.0243
	(0.0610)	(0.0978)	(0.0520)	(0.0763)	(0.1248)	(0.0672)
(Good Omen)*Female			-1.6146**			-2.3286**
			(0.8091)			(1.1193)
(Bad Omen)*Female			-2.1836*			-1.5006
			(1.2158)			(1.5481)
Constant	14.9067***	16.9178***	15.2884***	19.9994***	19.4686***	19.1709***
	(2.2559)	(3.3456)	(1.8637)	(2.8817)	(4.1510)	(2.3783)
Observations	426	293	719	426	293	719
Adjusted R-squared	0.520	0.536	0.523	0.136	0.141	0.126

Notes: In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

In Table 8 we replicate the same specifications of Table 7 considering as dependent variables the *Relative Expected Grade* (columns 1, 2 and 3) and the *Relative Overconfidence* (columns 4, 5 and 6). Results support our previous findings: on the one hand, while the *Bad Omen* has a negative impact on women's relative expectations and overconfidence, it has virtually no impact on men; on the other hand, the *Good Omen* exclusively affects males' relative expectations and overconfidence.

Table 8. Heterogeneous effects of Good and Bad Omens according to gender: OLS estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Relative Expected Grade			Relative Overconfidence		
	Females	Males	Whole	Females	Males	Whole
Grade	0.5122***	0.5860***	0.5396***			
	(0.0383)	(0.0412)	(0.0277)			
Bad Omen	-1.7749**	0.8158	0.7580	-2.2437**	-0.2063	-0.3937
	(0.8871)	(0.7772)	(0.7799)	(0.9746)	(1.1953)	(1.2074)
Good Omen	0.2578	2.0891***	1.8868***	0.1347	2.5729***	2.3880***
	(0.4839)	(0.6993)	(0.6246)	(0.7523)	(0.9029)	(0.8504)
Female			-0.0903			-0.1919
			(0.4145)			(0.5341)
Regular	1.7104**	-0.7033	0.7362	2.5302***	-1.3576	0.7953
	(0.6621)	(0.6003)	(0.4685)	(0.8263)	(0.8738)	(0.6187)
High School Grade	-0.0701***	-0.0498	-0.0592***	-0.2241***	-0.1527***	-0.1905***
	(0.0263)	(0.0329)	(0.0204)	(0.0305)	(0.0400)	(0.0247)
Lyceum	-0.5550	-0.6873	-0.5205	-1.7685***	-1.1391*	-1.4538***
	(0.4625)	(0.5539)	(0.3477)	(0.5646)	(0.6849)	(0.4297)
Parents' Education (avg.)	-0.0187	-0.0868	-0.0342	0.0580	-0.1835	-0.0239
	(0.0593)	(0.0997)	(0.0516)	(0.0777)	(0.1269)	(0.0682)
(Good Omen)*Female			-1.7067**			-2.2737**
			(0.7938)			(1.1333)
(Bad Omen)*Female			-2.4956**			-1.7247
			(1.1943)			(1.5865)
Constant	-3.6943	-1.7841	-3.2864*	17.8806***	18.1423***	17.4128***
	(2.2978)	(3.3387)	(1.8796)	(3.0244)	(4.1170)	(2.4358)
Observations	426	293	719	426	293	719
Adjusted R-squared	0.510	0.536	0.516	0.160	0.127	0.136

Notes: In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

We have also analyzed whether the treatment effects are heterogeneous according to student's ability or family background. More precisely, we have looked at the effects of *Bad* and *Good Omen* for students of ability above and below the average High School Grade and for parents' education above and below high school level. Quite surprisingly, we do not find heterogeneous effects: results are similar for students with high or low ability and for students with low and high levels of parental education (results not reported).

5. Placebo Regressions

The estimated effects of the *Good* and *Bad Omen* on overconfidence might reflect genuine responses by students or they might reflect spurious reactions not related to superstitions or emotions.

If these spurious effects were driving our results, we should find them also for numbers that are not associated by popular culture to good and bad omen. To verify this aspect, we estimate some placebo regressions defining some "fake" treatment groups composed, respectively, by students assigned to number 5 (*Placebo:5*) and by students assigned to numbers 11 and 28 (*Placebo:11_28*).

As shown in Table 9, in which we consider as dependent variable *Overconfidence* and report estimates of the specification including the full set of control variables separately for females (col. 1 and 4), males (col. 2 and 5) and for the whole sample (col. 3 and 6), in no specification we do find

evidence that the placebo treatment has had a statistically significant impact on students' overconfidence. No effect emerges also using alternative numbers as placebo treatments (not reported). These results reassure us that our estimates of the *Good* and *Bad Omen* effects on overconfidence are not spurious, but are related to superstitions and popular culture.

No effect emerges also when considering as dependent variable *Relative Overconfidence* (results not reported).

Table 9. Placebo Regressions. Impact of Fictitious Treatments on Overconfidence. OLS Estimates

	(1)	(2)	(3)	(4)	(5)	(6)
	Females	Males	Whole	Females	Males	Whole
Bad Omen	-1.3500*	-2.1316**	-0.4396	-1.2159	-2.0672**	-0.1749
	(0.7805)	(0.9173)	(1.1999)	(0.7882)	(0.9263)	(1.2132)
Good Omen	1.0498*	0.1676	2.4980***	1.1736**	0.2287	2.7243***
	(0.5448)	(0.7166)	(0.9275)	(0.5524)	(0.7210)	(0.9451)
Placebo: 5	-1.0957	-0.9811	-1.5895			
	(0.9269)	(1.4010)	(1.3100)			
Placebo: 11_28				0.2012	-0.0551	0.4341
				(0.6284)	(0.8526)	(0.9036)
Observations	719	426	293	719	426	293
Adjusted R-squared	0.124	0.136	0.143	0.122	0.134	0.139

Notes: The dependent variables is *Overconfidence*. In all specifications we control for the full set of control variables (individual ability, family background and for dummies for class attended, academic year and examination session). Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

6. Is Effective Performance affected by Good and Bad Omen?

In this section we investigate whether student's effective performance has been affected by our treatments. We estimate by OLS the specification including the full set of control variables considering as dependent variable the effective *Grade* obtained by students at exams. In column (1) we consider the whole sample, while in columns (2) and (3) we report our estimation results separately for females and males, respectively. We find that neither the *Bad Omen* nor the *Good Omen* produce any statistically significant effect on the effective grades obtained by students.

Although the expectations of students have been affected by superstitions and good and bad omens, their performance at examinations does not seem to be affected.

Table 10. The Impact of Good and Bad Omens and Effective Performance. OLS estimates

	(1) Whole	(2) Females	(3) Males
Bad Omen	1.4921	0.8432	2.1281
	(1.1033)	(1.3110)	(1.7503)
Good Omen	-0.2427	0.4633	-1.2418
	(0.7487)	(0.9503)	(1.2709)
Female	0.3732		
	(0.6257)		
Regular	-0.5332	-1.7261	0.7158
	(0.8671)	(1.1199)	(1.3167)
High School Grade	0.2856***	0.3260***	0.2366***
	(0.0324)	(0.0419)	(0.0547)
Lyceum	1.9381***	2.2527***	1.1902
	(0.6211)	(0.7792)	(1.0521)
Parents' Education (avg.)	0.0105	-0.1222	0.2586
	(0.0944)	(0.1151)	(0.1697)
Constant	-8.2982***	-10.6356***	-6.1605
	(3.0560)	(3.8473)	(5.1239)
Observations	719	426	293
Adjusted R-squared	0.167	0.200	0.140

Notes: The dependent variables is *Grade*. In all specifications we control for dummies for class attended, academic year and examination session. Standard errors (corrected for heteroskedasticity) are reported in parentheses. The symbols ***, **, * indicate that the coefficients are statistically significant at the 1, 5 and 10 percent level, respectively.

7. Concluding Remarks

Economic and psychological literature has consistently found that individuals' own-estimated performance exceeds their actual performance and the performance they expect to be obtained by their peers. Since overconfidence and relative overconfidence represent deviations from the traditional perfect rationality assumption, it is interesting to investigate which factors determine their realization.

In this paper we have analyzed if and how overconfidence is affected by superstitious beliefs and emotions. At this aim we have run a field experiment involving about 700 Italian students who were randomly assigned to numbered seats in their written examination sessions. According to widespread popular superstitions, some numbers are considered lucky, while others are considered unlucky. As a consequence, our investigation strategy was aimed at inducing emotions through positive and negative stimuli associated to superstitions related to the assigned numbers. We compute our indicators of overconfidence and relative overconfidence using information, gathered at the end of the examination session, about the grade students expect to get and the grade they expect to be obtained by their peers.

In line with a robust evidence, we find that students tend to be systematically overconfident. In addition, from our analysis it emerges that both absolute and relative overconfidence are positively affected by being assigned to a lucky number, whilst there is an imprecisely estimated negative effect for the bad omen stimulus. No effect emerges, instead, when considering the impact of the positive and negative treatment on students' effective performance. Our results are robust to alternative specifications of our model and controlling for individual background characteristics and individual ability.

Consistently with results found in other studies, overconfidence is higher among males. We also find that males and females react differently to negative and positive emotional stimuli. On the one hand, females tend to expect lower grades when assigned to unlucky numbers, while they are not affected by being assigned to lucky numbers. On the other hand, males are not affected by being assigned to unlucky numbers but they expect higher grades when assigned to lucky numbers. These results show that not only males and females differ in relation to a number of non-cognitive skills but they also show different psychological reactions. Our evidence suggests that a reason why females end up being less confident than males is because the former focus more on negative emotions.

References

Alicke, M., Klotz, M., Breitenbecher, D, Yurak, T. and Vredenburg, D. 1995, Personal contact, individuation, and the better-than-average effect. *Journal of Personality and Social Psychology*, 68 (5), 804–825.

Barber, B. and T. Odean. 2001. Boys Will Be Boys: Gender, Overconfidence, and Common Stock Investment. *Quarterly Journal of Economics*, 116(1), 261–92.

Baumann, A. O., et al. 1991. Overconfidence among physicians and nurses: The micro-certainty, macro-uncertainty phenomenon, *Social Science & Medicine*, 32, 167-174.

Bengtsson, C. et al. 2005. Gender and Overconfidence, *Economic Letters*, 86, 199-203.

Bertrand, M. 2010. New Perspectives on Gender. in *Handbook of Labor Economics*, ed. Ashenfelter Orley and David Card, volume 4B: 1545-1592, Elsevier.

Bourassa, S. C. and V. S. Peng, 1999. Hedonic Prices and House Numbers: The Influence of Feng Shui, *International Real Estate Review*, 2(1): 79-93

Brody, R., 1993. On understanding gender differences in the expression of emotion. In: Ablon, Steven L., Brown, Daniel, Khantzian, Edward J., Mack, John E. (Eds.), Human Feelings: Explorations in Affect Development and Meaning. Analytic Press, Hillsdale, NJ, pp. 87–121.

Buehler, R. et al., 2010; Finishing on time: When do predictions influence completion times?, *Organizational Behavior and Human Decision Processes*, 111, 23-32

Buehler, R., D. Griffin, and M. Ross 1994. Exploring the 'Planning Fallacy': Why People Underestimate Their Task Completion Times. *Journal of Personality and Social Psychology*, 67(3), 366–81.

Camerer, C., and D. Lovallo. 1999. Overconfidence and Excess Entry: An Experimental Approach. *American Economic Review*, 89(1): 306–18.

Capra, C. M. et al. 2010. The effects of induced mood on bidding in random nth-price auctions, *Journal of Economic Behavior & Organization*, Elsevier, 75(2), 223-234.

Cooper, A. C., et al. 1988, Entrepreneurs' perceived chances for success, Journal of Business Venturing, 3, 97-108.

Croson, R., and Gneezy, U., (2009), Gender Differences in Preferences, *Journal of Economic Literature*, 47, 2, 448-474.

Della Vigna, S. 2009. Psychology and Economics: Evidence from the Field. *Journal of Economic Literature*, 47(2), 315-72.

Della Vigna, S., and U. Malmendier. 2006. Paying Not to Go to the Gym. *American Economic Review*, 96(3), 694–719.

Diener, E., and R. A. Emmons. 1984. The Independence of Positive and Negative Affect. *Journal of Personality and Social Psychology*, 47(5), 1105-17.

Drichoutis, A. and Nayga, R. 2010, Eliciting risk and time preferences under induced mood states, MPRA

Edmans, A., D. Garcia, and O. Norli. 2007. Sports Sentiment and Stock Returns. *Journal of Finance*,

62(4), 1967–98.
Fehr-Duda, Helga, et al. 2011. Risk and rationality: The effects of mood and decision rules on probability weighting, *Journal of Economic Behavior and Organization*, 78(1-2), 14-24.
Flynn, James, Slovic, Paul, Mertz, C.K., 1994. Gender, race, and perception of environmental health risks. Risk Analysis 14, 1101–1108
Fujita, F., Diener, E., Sandvik, E., 1991. Gender differences in negative affect and well-being: the case for emotional intensity. *Journal of Personality and Social Psychology* 61 (3), 427–434.
Glaser, M., and M. Weber. 2007. Overconfidence and Trading Volume. *The Geneva Risk and Insurance Review*, 1: 1-36.
Hiller H., 2012, *Dizionario della superstizione*, Editore Castelvecchi
Icher, J., and H. Zarghamee. 2011b. "Positive Affect an Overconfidence: A Laboratory Investigation." Working Paper.
Ifcher, J., and Zarghamee, H. (2011a), "Happiness and Time Preference: The Effect of Positive Affect in a Random-Assignment Experiment", *American Economic Review*, 101(7), 3109-29.
Kent, D. D. Hirshleifer, and A. Subrahmanyam. 1998. Investor Psychology and Security Market Under- and Overreactions. *Journal of Finance*, 53(6), 1839–85.
Kirchsteiger, G., L. Rigottii, and A. Rustichini. 2006. Your morals might be your moods. *Journal of Economic Behavior and Organization*, 59(2), 155-72.
Kolb, R.W. and Rodriguez, R.J. (1987), Friday the Thirteenth: Part VII'-A Note, *Journal of Finance*, 5, 1385-1387.
Kramer, T., & Block, L. 2008. Conscious and nonconscious components of superstitious beliefs in judgment and decision making. *Journal of Consumer Research*, 34(6), 783–793.
Lewis, T.J. Gallagher (2001), The salience of friday the 13th for college students", *College Student Journal*, 35, 216–222.
Loewenstein, G. Weber, Elke U., Hsee, Christopher K., Welch, Ned, 2001. Risk as feelings Psychological Bulletin 127 (2), 267–286.
Malmendier, U., and G. Tate. 2005. CEO Overconfidence and Corporate Investment. *Journal of Finance*, 60(6), 2661-700.
Malmendier, U., and Geoffrey T.. 2008. Who Makes Acquisitions? CEO Overconfidence and the Market's Reaction. *Journal of Financial Economics*, 89(1): 20–43.
Menkhoff et al. 2006, The impact of experience on risk taking, overconfidence, and herding of fund managers: complementary survey evidence, *European Economic Review*, 50(7), 1753-1766
Newby-Clark, I. R., Ross, M., Buehler, R., Koehler, D. J., & Griffin, D. (2000). People Focus on Optimistic Scenarios and Disregard Pessimistic Scenarios While Predicting Task Completion Times, *Journal of Experimental Psychology: Applied*, 6(3), 171-182
Ng T., Ching, T. and Du X. (2010), The values of Superstitions, *Journal of Economic Psychology*, 31(3), 293–309.
Niederle, M., and L. Vesterlund. 2007. Do Women Shy Away from Competition? Do Men Compete Too Much?, *Quarterly Journal of Economics*, 122(3), 1067-101.
O'Reilly, D., Stevenson, M., 2000. The effect of superstition on the day of discharge from maternity units in Northern Ireland: a Saturday flit is a short sit. *Journal of Obstetrics and Gynaecology*, 20, 139-142.
Roberts, T., and Nolen-Hoeksama, S., 1989, "Sex Differences in Reactions to Evaluative Feedback," Sex Roles, XXI, 725–747.
Schimmel, A. 1994, The Mystery of Numbers. Oxford University Press.
Silverman, J., Kumka, D., 1987. Gender differences in attitudes toward nuclear war and disarmament. Sex Roles 16, 189–203.
Spigner, C., Hawkins,W., Lorens,W., 1993. Gender differences in perception of risk associated with alcohol and drug use among college students.Women and Health 20, 87–97.
Svenson, O. 1981. Are We All Less Ricky and More Skillful than Our Fellow Drivers?, *Acta Psycholigica*, 47(2), 143-48.
Torgler, B. 2007. The Determinants of Superstition, *Journal of Socio-Economics*, 36, 713–733.
Warning P., 2009, *Superstizioni e presagi. Origine e significato delle credenze popolari più note e diffuse nel mondo occidentale*, Armenia.
Wong, K., and Yung, L. 2005. Do dragon have better fate? *Economic Inquiry*, 43(3), 689–697.

Woo, C., and Kwok, R. 1994. Vanity, superstition and auction price. *Economics Letters*, 44(4), 389-395.

Woo, C., Horowitz, I., Luk, S., and Lai, A. 2008. Willingness to pay and nuanced cultural cues: Evidence from Hong Kong's license-plate auction market. *Journal of Economic Psychology*, 29(1), 35-53.

Yates, J.F., et al. (2002). Probability judgment across cultures. In: Gilovich, T., Griffin, D., Kahneman, D. (Eds.), Heuristics and Biases; The Psychology of Intuitive Judgment. Cambridge University Press, pp. 271–291.