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PREDICTORS OF GAMBLING AMONG UNIVERSITY STUDENTS: THE ROLE OF
GENDER, SOCIALITY AND ATTITUDES TOWARDS RISK

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Predictors of gambling among university students: the role of gender, sociality and attitudes towards risk

Abstract

In this paper, we seek to integrate the socio-psychological analysis of gambling behavior with the economic one. In particular, on the base of a questionnaire administered to university students, we analyze how attitudes towards risk, more precisely, the amount at stake at which preference for certainty prevails, contribute to predicting the probability of becoming a gambler.

1. Introduction

The gambling industry has undergone a relevant expansion in recent years, reaching a net worth of over $125 billion in 2013 worldwide (Repetti and Jung, 2013).

Because of the disquiet towards the social costs of gambling activity, in particular the effects on excessive gamblers and the ease of criminal involvement, the gaming sector has traditionally been marked by a legacy of prohibition (Eadington, 2004; Smith, 2000; Taylor and Kopp, 1991). The move to a legal status has typically gone through state monopolization, followed by a gradual liberalization, with firms operating under regulatory regimes. The recent changes in the technological and legal environment, in particular the introduction of electronic commerce and the fall in trade barriers, however, have, impaired government control, because of the ease of access to facilities that are outside its enforcement power (Siemens and Kopp, 2011).

The concern for the impact of the extensive availability of games is particularly strong as for the involvement of adolescents and young adults, who have always lived in a largely liberalized environment and among whom gambling is highly common (also in its online form, given the diffusion of the internet among younger people). This explains the presence of several studies on the determinants of gambling behavior conducted on school and university students all over the world (see, just to mention some examples, Williams *et al*., 2006; Browne and Brown, 1994; Forrest and McHale, 2012; Arthur *et al*.,

2008; Neighbors *et al*, 2002; Griffiths *et al*., 2010).

Research on young people's gambling did not found relevant differences between gamblers and non-gamblers in aspects such as introversion or extroversion, psychoneurotic tendencies or intelligence (Kusyszyn, 1984). This led to a social interpretation of gambling behavior, stressing the influence of parents and peers in facilitating it (Smith and Abt, 1984; Griffiths, 1990, 1995; Browne and Brown, 1994). In addition, gambling among parents is correlated to locus of control, in that students with an external locus of control, i.e. believing in chance rather than in individual control over one's destiny, have been found to be more likely to have parents who were gamblers (Browne and Brown, 1994; see also Rotter, 1966; Rotter *et al*., 1972).

Demographic variables such as gender (Kusyszyn, 1984; Browne and Brown, 1994; Volberg, 2003; Williams *et al*., 2006), education level (Brown *et al*., 1992), ethnicity (Williams *et al*., 2006), etc., have also been shown to be predictors of gambling behavior among young people.

Another factor analyzed in the literature has been derived by the cognitive-based explanation of gambling motivations, centered on the existence of a faulty reasoning: gamblers behave as if they could control the outcome of unpredictable events and/or think that an event is more predictable than it actually is (Ladouceur and Walker, 1996; Miyazaki et al., 2001). Clotfelter and Cook (1993) coined the term *gambler's fallacy* to denote the belief that the probability of a gambling event is lower once that event just occurred, even if the probability of its occurrence is independent across periods.

Actually, under an economic perspective, gambling consists in putting a given amount of money at stake, bearing the risk of losing it, but with the chance of winning a larger amount. Given that the amount of money staked by gamblers is lower than that distributed in winnings, the activity entails an expected loss.

However, winning money is not the only motive why people gamble: several studies have shown that people do it also for excitement, challenge, socialization, escape; in particular, Walker (1992), Griffiths (1995), Rogers (1998) and Aasved (2003) find that people derive pleasure from gambling by the social interactions with dealers and other gamblers. This is in line with the findings on peers' and parental influence (Browne and Brown, 1994).

Thus, factors others than money may represent a sort of reward, which may well exceed the expected loss from gambling. Under this perspective, regular gambling (not problem gambling) might look *less irrational*, even if its expected monetary gain is negative: gambling is a leisure activity and, in order to undertake it, people are willing to pay.

This is of course not to say that the aim of winning money should be underscored, and together with it the relevance of attitudes towards risk, when looking for the determinants of gambling behavior. In an economic perspective, recent studies have tried to reconcile observed behavior in betting markets with standard theory.

For instance, Peel and Law (2009) provide a non-expected utility model explaining why people gamble at actuarially unfavorable odds, or display risk-seeking behavior in gambling and risk-averse behavior in insurance. They

allow for heterogeneity in individual probability distortions, to be associated with cultural or institutional factors. Their model is based on Markowitz (1952) and Kahnemann and Tversky (1979) and Twersky and Kahnemann (1992). Markowitz (1952) assumed that, from the agent's normal level of wealth, the agent is initially risk loving, then risk averse over gains (while being initially risk averse and then risk loving over losses). Kahnemann and Tversky (1979) and Twersky and Kahnemann (1992) assumed that agents subjectively distort the probability of events, overestimating low probabilities and underestimating high ones, thus providing an explanation for the Allais (1953) paradox, an example of what they called the *certainty effect*: people give an excessive weight to certain results with respect to results that are only probable.

Recently, Bombardini and Trebbi (2012) have experimentally analyzed the relevance of the amount at stake in the gaming context. Also, the link between probability estimation and personality type has been explored in a neuropsychological perspective: Capra et al. (2013) find that "motivated" people, that is, people who are controlled and emotionally stable, consider gambling more attractive than impulsive people, since, though being risk averse, they positively focus on payoffs.

Against this background, in the present exploratory study we examine gambling behavior among university students, focusing on the characteristics differentiating (non-problem) gamblers from non-gamblers, seeking to integrate the socio-psychological analysis with the economic one.

2. Methodology

The basis of our research is a self-reporting survey conducted among students of the University of Pisa (Italy).In the period 31st July – 17th October 2013, we administered an online questionnaire to all enrolled students who had taken at least one exam among the courses taught in the Department of Economics and Management. The link to the questionnaire was sent by e-mail to 8.942 students, obtaining 855 answers.

Figure 1 shows the dynamics of the students' participation in the survey along the 78 days in which they had access to the online questionnaire. The solid curve represents the number of questionnaires completed at 11.00 p.m. of each day, while the dashed curve shows the number of questionnaires the compilation of which was interrupted before ending. Only data from completed questionnaires were used in our analysis. It is possible to distinguish five phases in the dynamics of responses. The first phase is characterized by a consistent inflow of questionnaires (200 of them were completed in 7 days). The second phase, coinciding with academic vacations, is characterized by a moderate participation in the survey. The third and fourth phases were triggered by a reminder sent by e-mail to students (on the 11th and on the 16th of September 2013, respectively), followed by the ending phase (the survey was closed on October 16th). Overall, 1.069 questionnaires were registered on the server, of which 855 were completed ones and 476 had been interrupted before the end.

Figure 1 - The dynamics of the students' participation in the survey
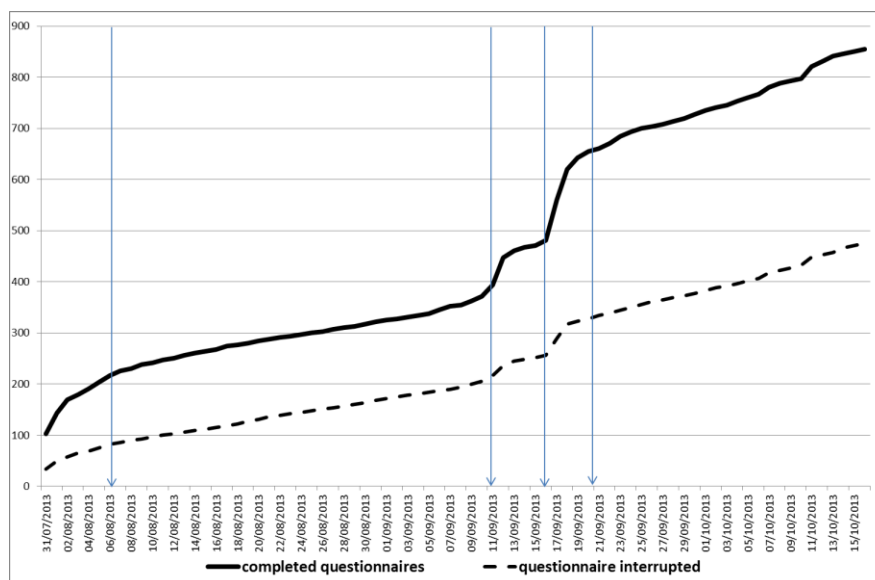
The questionnaire was divided into sections, each of them concerning a particular aspect; in the present analysis, the relevant ones are: attitudes towards gambling, perceived risks, reasons for having given up gambling behavior, attitudes towards risk, values, socio-demographic variables.

The average age of respondents was 25.29 (s.d. 5.04); 57.63% were women.

Attitudes towards gambling

From a public policy viewpoint, the debate on gambling is centered upon weighing its entertainment value against the social ills it might generate. It is thus important to assess the consumers' point of view with respect to the amusement derived from gambling vis-à-vis their perception of the connected social dangers and their assessment of state involvement.

Instead of the commonly used Gambling Attitude Scale, a three-item scale

developed to study gambling in adults (see, for instance, Williams et al, 2006), we have asked respondents to state whether they agreed or not on nine judgments concerning the entertainment value of gambling, social dangers connected to it and state intervention.

Perceived risks

Another aspect possibly differing between gamblers and non-gamblers is their perception of the risks connected to gambling. Respondents were therefore asked to evaluate, by means of a 0-10 scale, the importance of five risks: loss of control, developing a dependency similar to drug addiction, loss of family/friends esteem, becoming indebted, and loss of time.

Reasons for having given up gambling

In the survey, we also sought to investigate the reasons why people give up gambling behavior. On a 0-10 scale, respondents in this category were asked to evaluate the strength of the following motives: *gambling was no longer amusing*; *I had no time*; *I lost too much money*; *I was losing control*; *I was prohibited to gamble or advised to stop*.

It is interesting to note that several respondents did not admit to have gambled at least once in their lives when asked at the start of questionnaire (only 48.42% did it), but only when they arrived at this section.

Attitudes towards risk

One of the objectives of our study was to find a variable related to attitudes towards risk, to test its role and significance in predicting gambling behavior.

Our reference points were individual probability distortions and the relevance of the amount being staked.

As for the first aspect, respondents were asked to choose among lotteries characterized by the same expected pay-offs, but by different probabilities of the respective outcomes. On the basis of the choice made, we defined three different types of individuals: the *risk-lover*, who always chooses the lottery with the highest possible win; the *risk-averse*, who always chooses the lottery with the highest probability of winning; and the *typical*, who chooses the lottery with the highest probability of winning when probabilities of winnings are high and the lottery that gives the highest possible win when the probabilities of winnings are low (these individuals are called typical because they take the modal choice, as in Allais, 1953, and in several studies replicating his finding).

As for the second aspect, centered on Markowitz (1952) observations on the point at which people change from being risk-lover to risk-averse, we asked respondents to choose among the possibility of obtaining a certain amount of money for sure and an amount ten times larger with a probability of 10%, starting with the choice between € 1.00 for sure and € 10.00 with a 0.1 probability (level 1) until that between € 1 million for sure and € 10 million with a 0.1 probability (level 5; level 2 corresponded to a stake of € 10.00; level 3 to a stake of € 100,00; level 4 to a stake of € 1000,00; level 6 represents those who prefer having € 10 million with a 0.1 probability than € 1 million for sure). The answers given to these questions allowed us to construct a variable, that

we shall call *certainty*, for the sake of brevity, representing the amount of money at stake at which respondents became risk-averse, in order to test our presumption that a low level of this variable should be associated with a lower probability of being involved in gambling.

Values

By means of a 0-10 scale, respondents were asked to measure the importance in their lives of: being well off, self-realization, social esteem, success in sport, love, friendship, solidarity, passion, health, beauty, fitness, spirituality, being a winner.

Socio-demographic variables

For the present analysis, the relevant questions concerned the gender and the presence of gamblers in the family.

3. Data analysis and results

Gender, family and gambling behavior

43.16% of respondents declared to be at present involved in gambling activities; in particular, more than half of men (55.95%) and one third of women (3.40%) gambled. If we consider those who have gambled at least once in their lives, the share of gamblers becomes 67.84%; among men, the share is 80%; among women, 58.56%. As noted above, several ex gamblers did not immediately admit to have once gambled, declaring it only when given the

opportunity of describing the reasons why they had decided to put an end to the activity. More precisely, only 48.42% of the respondents immediately declared to have gambled at least once in their lives (64.32% of men and 36.29% of women), which corresponds to 19.42% of the sample (15.68% of men, 22.27% of women) having initially hidden it.

The result confirms the literature finding that men display a higher propensity to gamble than women do. This is also confirmed by the results on gambling frequency: in our sample, 81.84% of women actually involved in gambling activity declared to gamble less than once a month (for men, the share was 56.52%).

Looking at the influence of the family on gambling behavior, we found that almost half (49.12%) of the respondents had at least one gambler in their families (50.64% did not have any, 0.23% did not answer the question) and that the presence of other gamblers in the family appears to influence gambling behavior. Actually, considering those who have gambled at least once in their lives, 58.1% had at least one gambler in their families (41. 55% had not, 0.34% did not answer), against only 30.18% of non-gamblers. Comparing those who gamble at present with those who do not, the influence of the family appears even stronger, especially for women, as summarized in Table 1.

Table 1. Influence of gender and family on gambling behavior

Actual gamblers

Gamblers in family	Men	Women	Total
At least 1	59,90%	71,60%	65,04%
None	40,10%	27,16%	34,42%
Does not answer	0,00%	1,23%	0,54%
Total	100,00%	100,00%	100,00%

Attitudes towards gambling, gender, family and gambling behavior

Even if non-gamblers display a more negative attitude towards gambling than gamblers do, they are aware of the social dangers and critical towards state involvement. Less than half of the gamblers agrees that the activity is particularly exciting (63.4% of non-gamblers disagrees); the majority of both gamblers (58%) and non-gamblers (80.1%) does not consider gambling a leisure activity like the others, with 62.1 of non-gamblers and 31.9 of gamblers agreeing on the necessity of banning it. 77.3% of gamblers and 75% of non-gamblers think that gamblers are subject to a fiscal illusion, paying taxes to the government without realizing it, with 77.2 of non-gamblers and 54,5% of gamblers even considering the activity a fraud against consumers. Collecting revenues from taxing games is not considered a valid way of financing public expenditure (65,5% of non-gamblers, 55% of gamblers), unless it helps avoiding the introduction of new taxes (43.1% of non-gamblers, 31.9% of

gamblers). These results cast doubts on the possibility of increasing the acceptability of the state financial stake in the gaming industry by ear marking its proceeds for charity and the like. Almost all (94.5% of gamblers, 96.3% of non-gamblers) believe that the activity can be cause of financial ruin. However, 43.1 of gamblers and 32.7 of non-gamblers believes that, for some people, it represents the only possibility of improving their economic situation.

It should be noted that differences between gamblers and non-gamblers also derive by the fact that, as illustrated above, the majority of gamblers are men: actually, women in our sample display a more negative attitude towards gambling than men. For the same reason, the presence of other gamblers in the family is associated to a more favorable attitude.

Perceived risks

In general, people gamble despite a clear perception of the dangers being involved, which is typical of behaviors at the risk of creating an addiction. This appears in line with the attitude towards state involvement: many gamblers would welcome more intervention, as illustrated above. We find that average values do not differ much between gamblers and non-gamblers, though the former underscore risks with respect to the latter; however, other variables are involved: gender, with men consistently underscoring risks with respect to women; and family influence, with people having gamblers in their families underscoring risks with respect to people coming from non-gamblers' families. Also, the average score among ex gamblers who did not initially admit having been involved in the activity is higher than that of other people not gambling at

present; their reluctance might therefore derive from a negative experience from gambling.

The average scores obtained are summarized in Table 2.

Table 2. Average score of perceived risks

Risk	Gamblers	Non-gamblers
Loss of control	6,20	6,98
Addiction	6,70	7,20
Loss of social esteem	5,05	5,87
Becoming indebted	6,75	7,19
Loss of time	5,52	6,67

Reasons for having given up gambling

Among those who once gambled, the most important reason for giving up is that gambling was not an amusement any longer (average score: 4.73); the second most important motive was lack of time (average score: 2.95). For the other reasons, all scored around 1 on average, the order of importance is somehow different across gender and type of family (with or without gamblers). An excessive loss of money is the third one for men, as it is for women coming from a gamblers' family (for women coming from a non-gamblers' family, it is the fourth), while for women coming from a non-gamblers' one the third most important reason is *I was prohibited to gamble or advised to stop* (this reason is the fifth for those coming from a gamblers'

family); loss of control is the fourth for both men (together with *I was prohibited to gamble or advised to stop*) and women coming from gamblers' family, the fifth for those coming from a non-gamblers' one.

The result on *I was prohibited to gamble or advised to stop* for women, together with the one obtained on family's influence on gambling behavior, indicates that women are more responsive to their social context when deciding their participation in gambling.

Attitudes towards risk

Our sample resulted in 488 (57.08%) typical individuals, (237 men -64.05% - and 251 women – 51.75%), 315 (36.84%) risk-averse individuals (109 men – 29.46% - and 206 women – 42.47%) and 52 (6.08%) risk-lovers (24 men – 6.49% - and 28 women -5.77%). The individual type is correlated to gender, with women being more risk averse than men.

As for the certainty variable, 381 individuals (244 men and 381 women) started preferring certainty already at level 1; 99 (53 men and 46 women) at level 2; 174 (89 men and 85 women) at level 3; 110 (51 men and 59 women) at level 4; 48 (20 men and 28 women) at level 5, while 4 (2 men and 2 women) always preferred the possibility of a higher win to certainty; 29 (18 men and 21 women) did not answer the relevant questions.

The data show a difference between gamblers and non-gamblers: 60% of gamblers prefers to risk at level 1 against 47% of non-gamblers; at level 2, almost 50% of gamblers still prefers to risk, while only 33% of non-gamblers

does so. Note that € 1.00 and € 10.00 are typical stakes for the games played by respondents.

Also in this case gender is a relevant factor: half of the women would not put at stake € 1.00 to win € 10.00 with a 0.1 probability; at that level, instead, 63% of men would take the risk (and 49% would still do it at level 2).

Even if connected to gender, the level at which risk-aversion is trigged in appears to be a distinct factor: female gamblers are more likely to risk than male non-gamblers (49% against 36%). It can thus explain gambling behavior of both men and women. These aspects are summarized in Table 3.

Table 3. Attitudes towards risk, amount staked, gender and gambling behavior

Part A	Gamblers		
Level	Men	Women	Total
1	35,14%	45,77%	40,34%
2	13,18%	8,10%	10,69%
3	26,35%	18,31%	22,41%
4	13,18%	13,38%	13,28%
5	6,08%	7,75%	6,90%
6	0,68%	0,00%	0,34%
No answer	5,41%	6,69%	6,03%
Total	**100,00%**	**100,00%**	**100,00%**

Part B	Non-gamblers		
Level	**Men**	**Women**	**Total**
1	44,59%	56,72%	53,45%
2	18,92%	11,44%	13,45%
3	14,86%	16,42%	16,00%
4	16,22%	10,45%	12,00%
5	2,70%	2,99%	2,91%
6	0,00%	1,00%	0,73%
No answer	2,70%	1,00%	1,45%
Total	**100,00%**	**100,00%**	**100,00%**

Note that the level at which certainty preference prevails is just one factor in explaining gambling behavior: even individuals who would not risk € 1.00 do gamble. This is because, as argued above, people do not gamble just to win money.

Values

Love, passion and health resulted to be the most highly scored items on average. Gamblers and non-gamblers do not differ much as for values, unless for two items: friendship and solidarity. The former obtained an average score of 6.32 for gamblers and of 6.13 for non-gamblers; the latter obtained an average score of 5.95 for gamblers and of 6.33 for non-gamblers. The first result can be connected to the importance of the social element in gambling

behavior: university students are often led into gambling by their peers (see, for instance, Browne and Brown, 1994). The second result can be connected to those reviewed in Kusyszyn (1984), according to which, among male university students, gamblers are less socially responsible than non-gamblers; in our sample, however, the difference applies also to women.

Regression analysis

We use the data collected in our survey to integrate the existing literature on the determinants of gambling by testing the hypothesis that gambling behavior might be predicted by gender, family influence, the level of stake at which preference for certainty trigs in (certainty variable), and the importance of values such as friendship and solidarity.

Gender is an explanatory variable of the choice of the game type, in that it summarizes traits that specifically characterize men with respect to women (rather than gamblers with respect to non-gamblers, among which, attitudes towards gambling, perception of risks connected to gambling, individual distortion of probabilities). The higher propensity to gamble that characterizes men with respect to women, already pointed at in the literature (see, for instance, Volberg, 2003; McDaniel and Zuckerman, 2003; Welte et al., 2002), can in part be explained by the different strength of these factors.

Parental and peers' influence has already been linked to gambling behavior (see, for instance, Smith and Abt, 1984; Griffiths, 1990, 1995; Browne and Brown, 1994) within the social interpretation of gambling framework; we take these factors into account by means of a variable indicating the presence or

absence of (other) gamblers in the respondent's family; moreover, the strength of friendship among values is another variable accounting for the social element in gambling behavior. We also use the strength of solidarity as an explanatory variable, as suggested by the survey and by the literature result according to which students who gamble are less socially responsible than non-gamblers (Kusyszyn, 1984).

Differently from previous research, we also use a variable directly connected to attitudes towards risk, that is, the stake value at which the respondent shifts from being risk-lover to risk-averse. We can thus integrate our explanatory variables with an element deriving from the economic analysis of behavior under uncertainty.

Our dependent variable is being a gambler or not (gamblers include those who have gambled in the past) at least once in life. It is, therefore, an indicator variable, which reflects a qualitative rather than a quantitative description of the data; to be included in the regression, it must be represented numerically, which is achieved by defining a variable that takes the value 1 in the case of a gambler, 0 in the case of a non-gambler.

The explanatory variables are a constant, gender, presence of gamblers in the family, the certainty variable, the strength of friendship and that of solidarity among values. The level at which risk-aversion starts is a quantitative variable, as explained above. Friendship and solidarity are quantitative variables, their value being given by the score attributed to it by the respondent on a 0-10 scale, as explained above. Gender is a qualitative variable, which takes the

value 0 if the respondent is a woman and 1 if he is a man. Being a woman is a benchmark, the coefficient of the variable gender estimating the impact of being a man rather than a woman on the probability of being a gambler. The same applies to the family variable, the benchmark being a family without gamblers.

Given the discrete nature of the dependent variable, we use a logistic regression (the results with a probit model are, as one would expect, very similar, apart from a scale factor); coefficients estimate the impact of the relevant variable on the probability of being a gambler. Results are summarized in Table 4.

Table 4. Regression results

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	Coefficient	Std.Error	t-value	t-prob
Constant	0.728435	0.3552	2.05	0.041
Certainty	0.127507	0.06251	2.04	0.042
Gender	-1.01209	0.1711	-5.91	0.000
Family	1.11935	0.1661	6.74	0.000
Solidarity	-0.131243	0.04886	-2.69	0.007
Friendship	0.104927	0.04307	2.44	0.015

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Log-likelihood	-451.040264
No. of states	2
No. of observations	795
No. of parameters	6
Baseline log-lik.	-504.6311
Test: Chi^2(5)	107.18 [0.0000]**
AIC	914.080528
AIC/n	1.14978683
Mean (Y)	0.669182
Var (Y)	0.221377

Newton estimation (eps1=0.0001; eps2=0.005): Strong convergence

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	Count	Frequency	Probability	loglik
State 0	263	0.33082	0.33082	-255.0
State 1	532	0.66918	0.66918	-196.0
Total	795	1.00000	1.00000	-451.0

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As the results show, the respondents' gambling behavior can be explained in a

way that is consistent with the analysis of the previous sections. All explanatory variables are highly significant. To summarize:

- Gender influences the probability of being a gambler, in that the behavior is positively correlated to being a man.

- Also the presence of gamblers in the family increase the probability of becoming a gambler.

- The importance of friendship among values is positively correlated to being a gambler, which should be connected to the fact that university students are often led into the activity by their peers. On the contrary, solidarity is negatively related to being a gambler, confirming a trait already pointed at by the literature.

- The certainty variable, that is, the value of the stake at which people become risk-averse, positively affects the probability of being a gambler, as one would expect. As far as we know, this variable has never been added to personality and socio-demographic factors in explaining differences between gamblers and non-gamblers.

4. Conclusions

In this exploratory study, we have sought to integrate the socio-psychological analysis of gambling behavior with the economic one. In particular, we have found that attitudes towards risk, more precisely, the amount at stake at which preference for certainty prevails, contributes to predicting the probability of becoming a gambler.

The results of our study also support the literature stressing the relevance of social aspects in explaining gambling behaviour. Sociality is in fact a double-edged factor: it can act as a safeguard against excessive gambling, but it can also be the way in which people are led into gambling, because of family or peer induction. In particular, we have found evidence on the role of family and friends in inducing both to take up and to give up gambling. This appears to be especially true in the case of girls.

References

Aasved, M. (2003), The Sociology of Gambling, Springfield: Charles C. Thomas.

Arthur, D., W. L. Tong, C. P. Chen, A. Y. Hing, M. Sagara-Rosemeyer, E. H. Kua and J. Ignacio (2008), "The Validity and Reliability of Four Measures of Gambling Behavior in a Sample of Singapore University Students", *Journal of Gambling Stdies*, 24, 451-462.

Bombardini, M. and F. Trebbi (2012), "Risk Aversion and Expected Utility Theory: An Experiment with Large and Small Stakes", *Journal of the European Economic Association*, 10 (6), 1348-1399.

Brown, D. J., D. O. Kaldenberg and B. A. Browne (1992), "Socioeconomic Status and Playing the Lotteries", *Sociology and Social Research*, 76, 161-167.

Browne, B. A. and D. J. Brown (1994), "Predictors of Lottery Gambling Among American College Students", *Journal of Social Psychology*, 134 (3),

339-347.

Capra, C. M., B. Jiang, J. B. Engelmann and G. S. Berns (2013), "Can Personality Type Explain Heterogeneity in Probability Distortions?" *Journal of Neuroscience, Psychology, and Economics*, 6 (3), 151-166.

Clotfelter, C. T. and P. J. Cook (1993), "The 'Gambler's Fallacy' in Lottery Play", *Management Science*, 39, 1521-1525.

Eadington, W. R. (2004), "The Future of Online Gambling in the United States and Elsewhere", *Journal of Public Policy & Marketing*, 23 (Fall), 214-219.

Fang, X. and J. C. Mowen (2009), "Examining the Trait and Functional Motive Antecedents of Four Gambling Activities: Slot Machines, Skilled Card Games, Sports Betting, and Promotional Games", *Journal of Consumer Marketing*, 26 (2), 121-131.

Forrest, D. and I. G. McHale (2012), "Gambling and Problem Gambling among Young Adolescent in Great Britain", *Journal of Gambling Studies*, 28, 607-622.

Griffiths, M. (1990), "Adolescent Gambling: An Observational Pilot Study", *Perceptual and Motor Skills*, 70, 1138.

Grifiths, M. (1995), *Adolescent Gambling*, London: Routledge.

Griffiths, M., J. Parke and R. Wood (2010), "Online Poker Gambling in University Students: Further Findings from an Online Survey", *International Journal of Mental Health and Addiction*, 8, 82-89.

Kahnemann, D. and A. Twersky (1979), "Prospect Theory: An Analysis of Decision under Risk", *Econometrica*, 47 (2), 263-291.

Kusyszyn, I. (1984), "The Psychology of Gambling", *Annals of the American Academy of Political and Social Science*, 474, 133-145.

Ladouceur, R. and M. Walker (1996), "A Cognitive Perspective on Gambling", in P. Salkovskis (Ed.), *Trends in Cognitive and Behavioral Therapies*, New York: John Wiley and Sons, 89-120.

Lam, D. (2007), "An Exploratory Study of Gambling Motivations and Their Impact on the Purchase Frequencies of Various Gambling Products", *Psychology and Marketing*, 24 (9), 815-827.

Markowitz, H. M. (1952), "The Utility of Wealth", *Journal of Political Economy*, 56, 151-154.

McDaniel, S.R. and M. Zuckerman (2003), "The Relationship of Impulsive Sensation Seeking and Gender to Interest and Participation in Gambling Activities", *Personality and Individual Differences*, 35 (6), 1385-1400.

Miyazaki, A. D., A. M. Brumbaugh and D. E. Sprott (2001), "Promoting and Countering Consumer Misconception of Random Events: The Case of Perceived Control and State-Sponsored Lotteries", *Journal of Public Policy and Marketing*, 20, 254-267.

C. Neighbors, T. W. Lostutter, M. E. Larimer and Ruby Y. Takushi (2002), "Measuring gambling outcomes among college students", *Journal of Gambling Studies*, 18, 339-360.

Peel, D. and D. Law (2009), "A More General Non-expected Utility Model as an Explanation of Gambling Outcomes for Individuals and Markets", *Economica*, 76, 251-263.

Rogers, P. (1998), "The Cognitive Psychology of Lottery Gambling: A Theoretical Review", *Journal of Gambling Studies*, 14, 111-134.

Rotter, J.B. (1966), "Generalized Expectancies for Internal versus External Control of Reinforcement, *Psychological Monographs: General and Applied*, 80 (!, Whole No. 609).

Rotter, J. G., J. E. Chance and J. E. Phares (1972), *Applications of a Social Learning Theory to Personality*, New York: Holt, Rinehart and Winston.

Siemens, J. C. and S. W. Kopp (2011), "The Influence of Online Gambling Environments on Self-Control", *Journal of Public Policy & Marketing*, 30 (2), 279-293.

Smith, J. F. and V. Abt (1984), "Gambling as Play", *Annals of the American Academy of Political and Social Science*, 474, 123-132.

Smith, J. (2000), "Gambling Taxation: Public Equity in the Gambling Business", *Australian Economic Review*, 33, 120-144.

Taylor, C. R. and S. W. Kopp (1992), "Games Contests, and Sweepstakes Run Afoul: A State of Legal Disorder", *Journal of Public Policy & Marketing*, 10 (Spring), 199-213.

Tversky, A. and D. Kahnemann (1992), "Advances in Prospect Theory:

Cumulative Representation of Uncertainty", *Journal of Risk and Uncertainty*, 5 (4), 297-323.

Volberg, R. A. (2003), "Has There Been a 'Feminization' of Gambling and Problem Gambling in the United States?", *The Electronic* Journal *of Gambling Issues*, 8, http://www.camh.net/egambling/issue8/feature.

Walker, M. B. (1992), *The Psychology of Gambling*, Oxford: Pergamon Press.

Welte, J. W., G.M. Barnes, W.F. Wieczorek, M.-C. Tidewell and J. Parker (2002), "Gambling Participation in the U.S. – Results from a National Survey", *Journal of Gambling Studies*, 18 (4), 313-337.

Williams, R. J., D. Connolly, R. T. Wood and Nadine Nowatzki (2006), "Gambling and Problem Gambling in a Sample of University Students", *Journal of Gambling Issues*, 16 (April), 1-14.