

INVESTIGATION OF ATTITUDES TOWARD GAMBLING WITH IMPLICIT ASSOCIATION TEST AND SELF-REPORTED MEASURES

Plotka Irina

Doctor of psychology, profesor
Baltic Psychology and Management University College, Riga, Latvia
Brivibas gatve 211- 52. Riga, LV-1039, Latvia

Igonin Dmitry

Doctor of psychology, leader researcher. Latenta” Ltd, Riga, Latvia

Blumenau Nina

Doctor of Engineering Sciences, as. Professor
Baltic Psychology and Management University College, Riga, Latvia

Simane Laura

Master of Psychology, Student of Doctoral Program
Baltic Psychology and Management University College, Riga, Latvia
Daugavpils University, Daugavpils, Latvia

Lutikova Natalja

Master of Psychology. Baltic Psychology and Management University College, Riga, Latvia

Morozova Margarita

Master of Psychology. Baltic Psychology and Management University College, Riga, Latvia

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ABSTRACT

Attitudes towards gambling have been mostly measured with explicit methods, although it has been stated that explicit attitude measures could have significant limitations due to the social desirability.

The aim of research is to identify the valence of attitudes to gambling using implicit and explicit measurements in none-problem social gamblers, who regularly visit gaming establishments and people who do not go to the gaming establishments.

Methods: Single-Category IAT; Breen and Zuckerman's Gambling Attitudes and Beliefs Scale (GABS). Sample 50 participants. Age 18-45 (Me=31,5). Groups: "Gamblers" - casino visitors at least once a week, non-problem social gamblers - 25 and "Non-Gamblers" - 25.

Results: GABS measures of attitudes expose that the attitudes' to gambling level in the group "Gamblers" exceeds the attitudes' to gambling level in the group „Non-Gamblers”. The positive and

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negative attitudes toward gambling have been identified, measured with the help of SC-IAT, in both groups. It has been shown that the severity of implicit positive and negative attitudes in both groups is the same. The maximum percentage of the coincidences of the attitudes toward gambling gained with GABS and IAT are 52%.

Conclusion: It is possible that the presence of negative attitudes toward gambling can provide a possibility to non-problematic social gamblers to overcome gambling addiction.

Keywords: Attitudes toward gambling, implicit attitudes, implicit association test, explicit measure

INTRODUCTION

Gambling addiction is common all over the world. Over the past three decades, gambling has undergone a profound transformation. Gaming business is being delivered in some of the largest markets in the world. It is an economically marginal and morally questionable activity, which, at the beginning of the 21st century, has become a global problem (Reith, 2003).

Gambling addiction – an unhealthy condition characterized by uncontrollable psychological dependence on the game, emotional imbalance, and as a consequence of depression. This dependence refers to a non-chemical form of addictive behaviour, known as gambling.

In Latvia, social surveys were conducted, the results of which showed that there is a growing share of respondents who say that there is a problem in their families with underage family members and their propensity for gambling. (Data obtained from the website of the Latvian Association of Gaming business, Latvijas spēļu biznesa asociācija http://www.lsb.lv/lv/sociologiskie_petijumi).

Addictive behaviour – a form of destructive behaviour that leads to the desire to escape from reality by changing their mental state with the help of an intake of certain substances or permanent fixation of attention on particular subjects or activities, accompanied by the development of intense emotions.

Social gamblers consider gambling to be a valid form of recreational activity, and maintain full control over the time, money and energy they expend on gambling. They consider the cost of gambling to be payment for entertainment (Davis, 2003).

Attitude – relatively enduring and general evaluation of an object, person, group, issue, or concept on a scale ranging from negative to positive. Attitudes provide summary evaluations, and past behaviours associated with those objects (APA Dictionary, 2009).

Attitudes can be measured with two different assessment methods: explicit and implicit.

Explicit attitude measure – any procedure for evaluating attitudes in which a person is consciously aware of the fact that his or her attitude toward something or someone is being assessed. Measures of this type are generally direct attitude measures (APA, 2009).

Implicit attitude measure – an attitude measure in which a person is not consciously aware of the fact that his or her attitude is being assessed. Measures of this type are generally indirect attitude measures (APA, 2009).

Implicit association test (IAT) – an implicit attitude measure in which participants perform a series of categorization tasks on computer for a set of words representing an attitude object (e.g., words such as ant, fly, and grasshopper representing the attitude objects of insects) and for a second set of intermixed words, selected to be highly evaluative in nature. In one phase of the test, the computer response key used to indicate membership in the specified category is the same as that used to indicate a positive word. In a different phase, the key used to indicate membership in the specified category is the same as that used to indicate a negative word. If attitudes are positive, judging the target words should be faster when the same response key is used for category membership and positive words than when the same response key is used for category membership and negative words. Negative attitudes produce the opposite pattern (APA, 2009).



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Attitudes towards gambling have been mostly measured with explicit methods, although it has been stated that explicit attitude measures could have significant limitations due to the social desirability. Especially, when measuring as socially sensitive topic as attitudes toward gambling, participants could be motivated not to report the true attitudes. It could also be possible that the reason for the untrue responses could be the fact that participants are not consciously aware of their true attitude. In other words, gamblers are highly likely to be motivated to underreport on these matters. These limitations of self-report measures are the main reasons to consider implicit or automatic measures of attitudes (Greenwald & Banaji, 1995).

Assessment of implicit processes have been accompanied by new dual-process models of addictive behaviours (Wiers, & Stacy, 2006). According to dual process models, addictive behaviours are determined by the dynamic interaction of two different qualitative processes: the fast, automatic "impulsive system" and the slow, deliberative "reflective system" (Strack & Deutsch, 2004). The reflective system is responsible for carrying out processes of rule-based reasoning and of symbolic representation. It generates deliberative judgments and decisions, and serves executive functions, such as scheduling casino trips in advance, resisting the temptation to gamble, or preparing plans for reducing the frequency of casino visits. Because the reflective system is slow and amenable to conscious access and deliberation, self-report measures are suitable for assessing the reflective processes of gambling (Yi, & Kantekar, 2010). The impulsive system refers to "a network in which information is processed automatically through a fast and parallel spread of activation along the associative links between contents" (Strack & Deutsch, 2004, p. 208). It represents patterns of activation in an association network, which are organized on the basis of close temporal or spatial proximity. The impulsive system is mainly responsible for the simultaneous activation of the concept of gambling and positive affect in memory, which is thought to be prevalent in individuals who find themselves engaging in Internet gambling against their resolution not to gamble on-line (Yi, & Kantekar, 2010). Unlike the reflective system, the impulsive system is posited to operate on the basis of automatic activation of associative links in memory and to require little cognitive capacity (Strack & Deutsch, 2004). Implicit measures of attitudes have been considered one promising way of assessing the strength of automatic association between a focal concept (e.g., gambling) and valence (i.e., positivity/negativity) in memory. A popular definition of implicit attitudes is "introspectively unidentified traces of past (Yi, & Kantekar, 2010).

One of the studies attitudes to gambling using implicit measures has been conducted by Yi and Kantekar (2010). It investigated whether individuals with a greater risk of gambling problems will have more positive implicit attitudes than those with lower gambling risk. There were three latency based measures used in the research: adapted evaluative priming procedure, adapted single category IAT procedure (SC-IAT) and an Arousal-Sedation ST-IAT. The Arousal-Sedation ST-IAT, because no obvious contrast category for gambling could be found. There were also three explicit measures used (Ferris & Wynne, 2001; Breen, & Zuckerman, 1999; Steenbergh, Meyers, May, & Whelan, 2002). According to CPGI participants were classified into four categories, based on the gambling risk (non-gamblers, - low-risk gamblers, moderate risk gamblers, pathological or high-risk gamblers) (Yi, & Kantekar, 2010). It was found, that SC-IAT procedure is a bipolar measure of attitudes in which participants are asked to map their attitudes toward gambling in the positive-negative bipolar dimension. Further, the convention of taking the difference of two combination blocks prevents researchers from exploring the possibility that individuals have simultaneously strong positive and negative attitudes toward the focal concept. It can be explained by the possibility that as gambling severity increases, both positive and negative automatic associations become stronger but at different rates.

The research of Bravers, Cleeremans, Hermant, Tibboel, Kornreich, Verbanck, & Noel (2013) is a continuation of the study of Yi and Kantekar (2010), which tries to reveal the state of the dual-attitudes towards gambling, not just to reveal that gamblers hold stronger positive than negative atti-

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tudes towards gambling as it was done in the previous study. To be able to try to reveal the dual-attitude - towards gambling, as the implicit assessment method, an unipolar ST-IAT was used that contrasts one category with neutral categories, instead of contrasting two attribute categories with each other, as it was done in the experiment of Yi and Kantekar (2010). In the Bravers' study (Bravers, et al., 2013) there were two forms (positive and negative) of modified ST-IATs used. The sample consisted of two groups – 25 problem gamblers and 25 non-gamblers. The results of the study showed that in comparison with non-gamblers, problem gamblers exhibit positive, but not negative, implicit attitudes toward gambling. Whereas gamblers experienced deleterious effects related to gambling, implicit attitude toward gambling remained positive, thus hampering attempts to quit gambling. The results indicate that gambling cannot be associated with positive and negative automatic associations – they need to be polarized to be clearly detected.

In the research (Yi, & Kantekar, 2010) the groups were formed of students in a medium-sized university. According to the Canadian Problem Gambling Index (CPGI), participants were classified into four categories, based on the gambling risk. The results indicated bipolar attitudes to gambling addiction, revealed with the help of implicit measures (SC-IAT). In the second research (Bravers, et al., 2013) the group of gamblers was formed of problem gamblers. An unipolar ST-IAT was used. Problem gamblers exhibit only positive, but not negative, implicit attitudes toward gambling.

The aim of our research is to identify the valence of attitudes to gambling using implicit and explicit measurements in none-problem social gamblers, who regularly visit gaming establishments and people who do not go to the gaming establishments.

Research questions:

Is there a correspondence between results of implicit measures and explicit measures of attitude towards gambling?

Are the differences in attitudes to gambling revealed by explicit and implicit methods among gamblers and non-gamblers?

METHODS**Participants**

The sample consisted of 50 participants. All participants were male tapping in to the age group of 18-45 ($M=31.5$). The native language of all of the participants was Russian. The participants consisted of two groups: "Gamblers" ($N=25$) and "Non-Gamblers" ($N=25$). "Gamblers" were selected from casino visitors at least once a week. All of them belong to category of "non-problem social gamblers", who are employed or learning. The "Non-Gamblers" group consisted of male participants, who have no observed gambling behavior or/and addiction. Education: 20 people - secondary education, 14 people – secondary- special education, 16 people higher education. Marital status - 30 people were single, 20 were married. This age group is chosen based on the fact that in Latvia it is allowed to visit gambling establishments starting from the age of 18. Also, this age group is the most vulnerable to gambling addiction, especially when the current unfavorable economic situation in the country is taken in to account.

Explicit measures of attitudes

Breen and Zuckerman's Gambling Attitudes and Beliefs Scale (GABS) was selected as a self-report measure of attitudes toward gambling (Breen, & Zuckerman, 1999). GABS had undergone an initial adaptation process and has been modified for Russian language speaking audience. The translation of the method to Russian language was performed using a reverse translation method: the GABS translation in Russian was translated further back to English by an independent translator. After this the original text of GABS was compared with the final translation in English and the dif-



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ferences between the translation and the original were discussed and adjustments were made the final text of GABS Russian version. GABS showed acceptable internal consistency (coefficient alpha = 0.70) (George, & Mallery, 2003). GABS is a 35-item, 4-point scale. GABS items were constructed to capture a wide range of positive evaluation of gambling, cognitive biases and irrational beliefs, attitudes, and characterizing behaviors. According to the authors, all the items of GABS could be loaded on one big factor, which can be represented as a general affinity to gambling. Therefore, GABS can evaluate individuals, who, at the moment, are not pathological gamblers, but who may have cognitive risk factors that indicates the possibility of becoming a problem-gambler (Breen & Zuckerman, 1999).

Implicit measures of attitudes toward gambling

Single-Category IAT (SC-IAT) that was designed based on the design of the classical IAT, using only six, not seven trial blocs as it is in classical seven-block IAT design (Greenwald, 1995). Karpinski and Steinman's (2006) SC-IAT procedure was adapted in order to assess the non-relative implicit attitude toward gambling. The modified SC-IAT combined verbal and visual stimulus (6 pictures with gambling theme, covering different types of gambling).

In the first block (a training block), participants were instructed to press a left-hand key (e.g., the "q" key) as soon as possible in response to exemplars of the "pleasant" attributes and the target category (i.e., gambling) and to press a right-hand key (e.g., the "p" key) in response to exemplars of the "unpleasant" attributes (30 trials).

In the second block, if a visual target category (i.e., gambling) or "pleasant" attributes were presented, a participant had to press the left key "q", if "unpleasant" attributes were presented, the participant had to press the right key "p" (34 trials).

The third block was identical to the second block (34 trials).

The fourth block was a training block again, where the change of associations occurred. The participant needed to press the right key "p" if the target category (i.e., gambling) or "unpleasant" attributes were presented and the left key "q" if "pleasant" attributes were presented (30 trials).

The fifth and sixth blocks were analogical- the participant was asked to press the left key "q" if "pleasant" attributes was presented and right key "p" if a gambling-related visual target category or "unpleasant" attributes were presented (34 and 34 trials).

When participants made an inaccurate response, a red X appeared in the centre of the screen for 150 ms.

Apparatus

The modified SC-IAT was designed for the present study on a licensed computerized apparatus E-Prime 2.0.

Stimulus

Target category:

The target categories were presented in verbal form – (game for money) and in visual form - 6 pictures with gambling theme, covering different types of gambling.

"Unpleasant" attributes:

Terrible, Bad, Humiliating, Calamitous, Hideous, Catastrophic, Abusive, Discouraging, Disappointing, Nasty, Gloomy. (Ужасный, Плохой, Унизительный, Бедственный, Отвратительный, Катастрофический, Оскорбительный, Обескураживающий, Неутешительный, Противный, Мрачный).

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“Pleasant” attributes:

Awesome, Excellent, Wonderful, Marvelous, Excellent, Pleasant, Grandiose, Attractive, Amazing, Fascinating, Impressive. (Потрясающий, Отличный, Чудесный, Замечательный, Превосходный, Приятный, Грандиозный, Привлекательный, Изумительный, Увлекательный, Впечатляющий).

Proceeding of IAT's Data

A comprehensive analysis of various scoring algorithms, based on hundreds of thousands of Project Implicit respondents, resulted in recommending the D statistic (Greenwald, Nosek, & Banaji, 2003). The D statistic is an effect size. D is “personalized” i.e., based on each person’s variance in response latencies. The D statistic has several advantages, including reducing the effect of task order in the IAT, reducing practice effects when people perform multiple IATs, and maximizing the correlation between the IAT and explicit measures. Another important advantage is that it reduces unwanted variance (“noise”) based on individual differences in reaction times and cognitive skill (Rudman, 2011).

Computation of the D statistic includes the following preparatory steps:

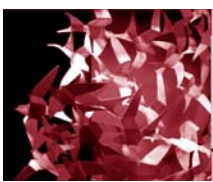
Delete all trials greater than 10,000 ms and less than 300 ms (1). Compute the average latencies separately for trials performed during blocks 2, 3, 5, and 6 (2). Compute the combined standard deviation for each subject for blocks 2 and 5, and likewise for blocks 3 and 6 (3). Compute the two differences: and (4). Divide each difference score by its combined standard deviation (5). D equals the equal-weight average of two resulting ratios (6).

You then can compute two difference scores (contrast 1 and contrast 2). For subjects who performed the IAT as illustrated in Figure 3.1, contrast 1 subtracts the mean response latency for block 3 from block 6; contrast 2 subtracts the mean response latency for block 4 from block 7. For subjects who performed the IAT in the reverse order, contrast 1 subtracts the mean response latency for block 6 from block 3; contrast 2 subtracts the mean response latency for block 7 from block 4. In each case, White + Good is subtracted from Black + Good, so that positive scores reflect faster responses when pairing Whites with good and Blacks with bad, compared with when these associations are reversed.

The result is the D statistic, which represents an IAT effect that is individually standardized for each subject. Because it is an effect size, the D statistic provides an estimate of the magnitude of the IAT effect: D statistics of .15, .35, and .60 correspond to small, medium, and large effect sizes, respectively (Rudman, 2011).

Procedure

The study was conducted in January 2013. Participation was voluntary. Participants were required to provide the information of their gender, age, marital status and if they are visiting the gambling establishments (if visiting, how often). There were 2 groups formed: “Gamblers” – participants, who attend gambling institutions not less than once a week, and “Non-Gamblers” – participants, who do not gamble and do not consider themselves as gamblers. For the group “Gamblers”, experiment was conducted in gambling establishments in Daugavpils (Latvia). In the first block participants completed the GABS questionnaire. With it’s help consciously defined attitudes to gambling were revealed. In the second block, the modified version of SC-IAT was presented to the participants. An implicit attitude towards gambling was revealed.



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RESULTS

Fig.1-2 show histograms with normal curve, that allow to conclude about the empirical data distributions' correspondence to normal distribution. Statistical tests revealed that the variable's "D" distribution significantly differs from the normal distribution (in the whole sample, and in the group "Non-Gamblers"). In cases of the other variables the difference from normal distribution was not found.

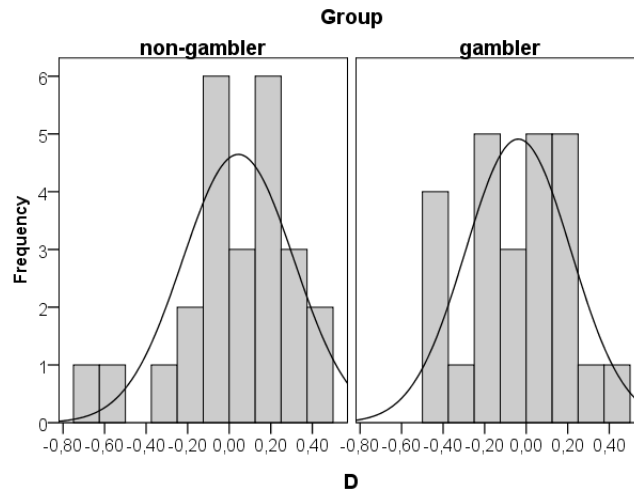


Fig.1. Histograms with normal curves for „Gambler” and „Non-Gambler” Groups. IAT's results „D-scores”

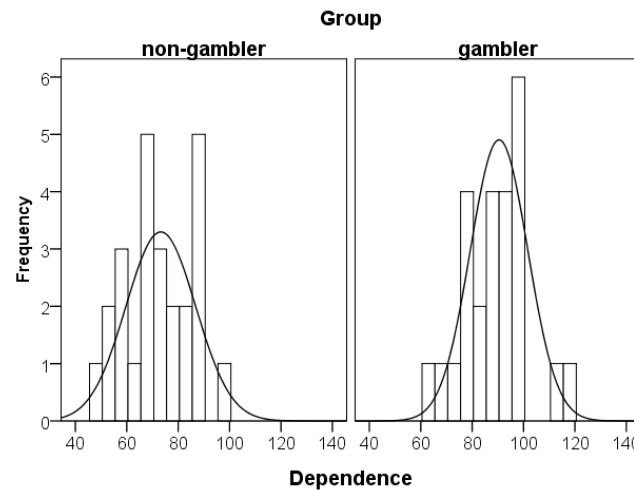


Fig.2. Histograms with normal curves for „Gambler” and „Non-Gambler” Groups. Explicit Variable „Dependence”

Explicit measures of attitudes (GABS) (variable „Dependence”) expose that the attitudes' to gambling level in the group „Gamblers” exceeds the attitudes' to gambling level in the group „Non-Gamblers” (Fig.3):



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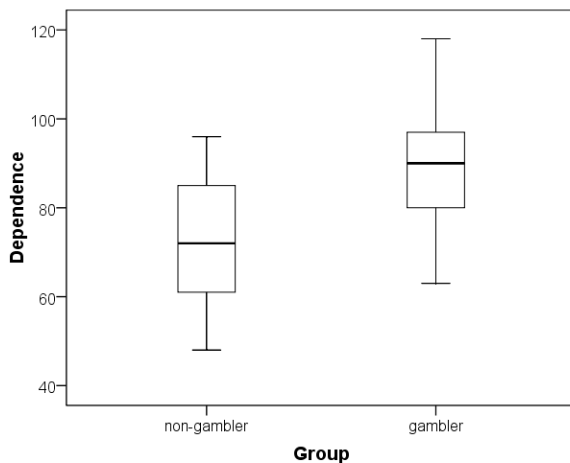


Fig.3. Boxplots for „Gambler” and „Non-Gambler”. Explicit Variable „Dependence”

The variable “D-scores” - the result obtained with the help of IAT, statistically significant differences between groups “Gamblers” and “Non-Gamblers” was not found(Fig.4).

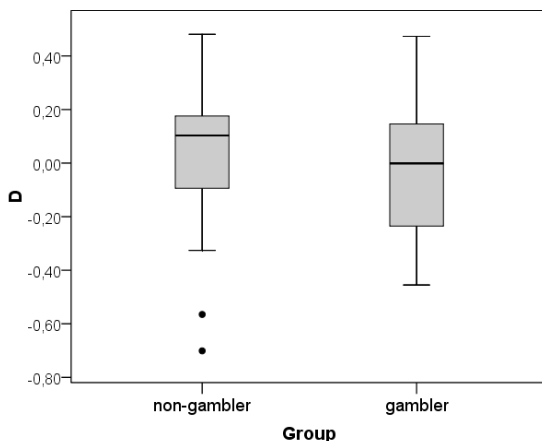
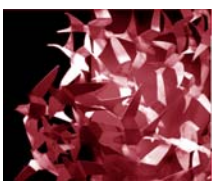


Fig. 4. Boxplots for „Gambler” and „Non-Gambler”. Groups. IAT’s results „D-scores”

With the help of pie-charts (Fig. 5-6) the count of gamblers (in percents) with different levels of attitudes’ to gambling in „Gambler” and „Non-Gamblers” groups are shown.

According to GABS (Fig.5, variable „Dependence”) the scores were divided into four levels (no gambling addiction, moderate desire for gambling, gambling addiction, severe gambling addiction). There were no participants with no gambling addiction in the sample. That is why, the remaining groups were marked: neutral, high, critical.



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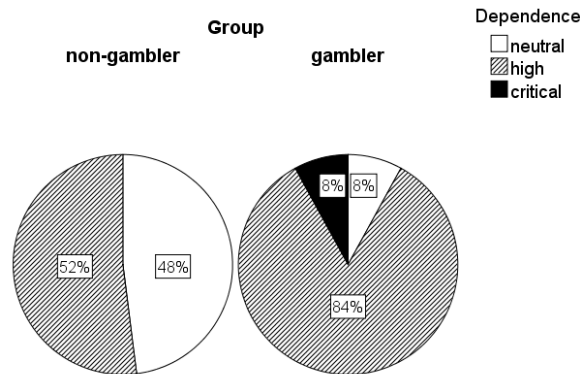


Fig. 5. Pie for „Gamblers” and „Non-Gamblers”. Explicit Variable „Dependence”

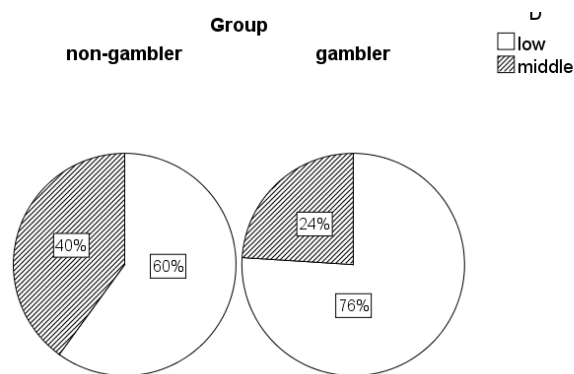


Fig. 6. Pie for „Gamblers” and „Non-Gamblers”. IAT's results „D-scores”

Figures 7-8 show the results of measurements of gambling with the explicit method GABS (levels of gambling addiction: gray bars - neutral, bars in diagonal stripes - high, in horizontal stripes - critical) and IAT (black bars: 0.15 - small effect 0.35 of gambling addiction - average effect, 0.60 - high effect). To visualize the variable “Dependence”, measured explicitly, the results have been divided by 200. The horizontal axis indicates the codes of participants. Groups “Gamblers” and “Non-Gamblers”.

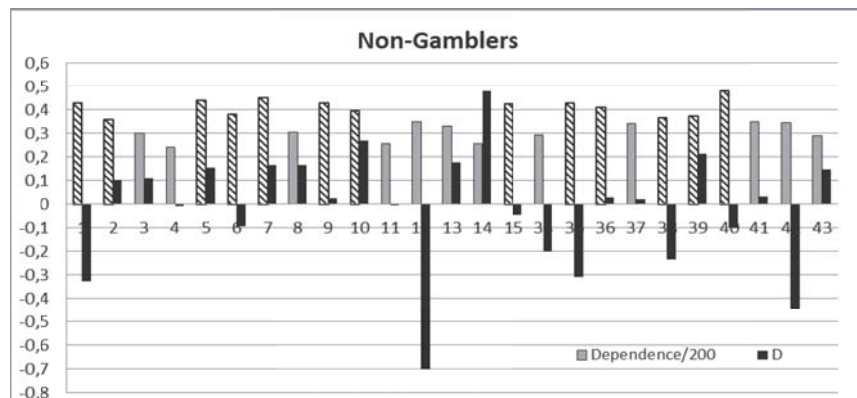


Fig.7. The results of attitudes to gambling measures with explicit method GABS (the levels of gambling addiction: the second column (light grey) – neutral, the oblique striped column – high and the column with horizontal stripes – critical) and SC-IAT (black columns: 0,15 – little effect, 0,35 – medium effect of gambling addiction, 0,60 – high effect). To visualize the variable “Dependence”, measured explicitly, the results have been divided by 200. Group “Non-gamblers”



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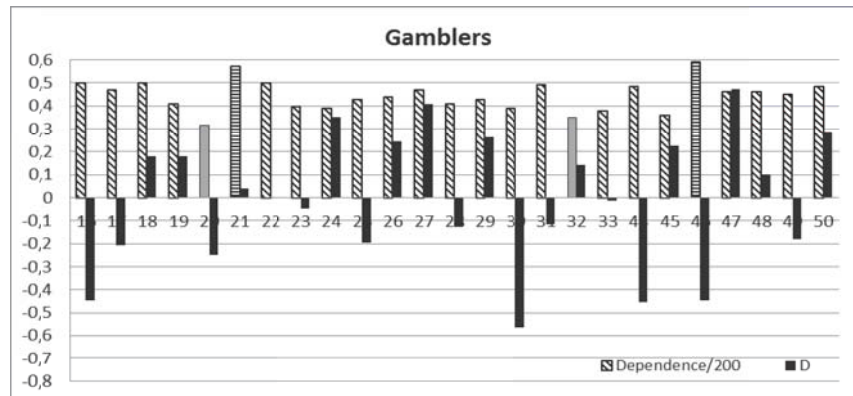


Fig. 8. The results of attitudes to gambling measures with explicit method GABS (the levels of gambling addiction: the second column (light grey) – neutral, the oblique striped column – high and the column with horizontal stripes – critical) and SC-IAT (black columns: 0,15 – little effect, 0,35 – medium effect of gambling addiction, 0,60 – high effect). To visualize the variable “Dependence”, measured explicitly, the results have been divided by 200. Group “Gamblers”

From the figures it is possible to detect that the measured attitudes of gambling with SC-IAT are ambivalent. That is, the results of the implicit attitude measurements toward gambling must be treated with great caution. The existence of negative D-scores, obtained with the help of implicit measure, does not mean that there is no gambling addiction present. It rather suggest the internal desirability (being ready) to deal with the gambling addiction.

С помощью One Sample t-test было найдено, что (Fig.9):

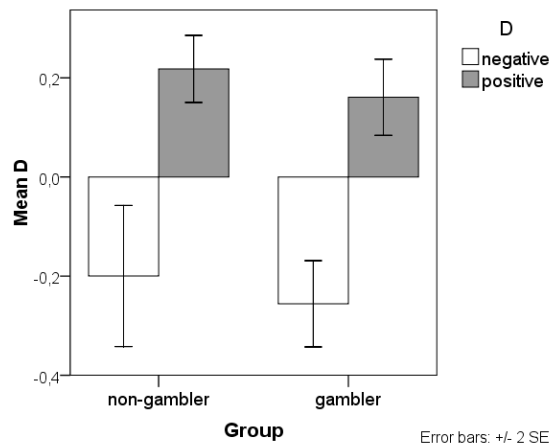


Fig. 9. Positive and negative D-scores for “Gambler” and “Non-Gambler” Groups

- 1) The Mean of negative D in Group „Gambler” statistically significantly differs from zero: ;
- 2) The Mean of positive D in Group „Gambler” statistically significantly differs from zero: ;
- 3) The Mean of negative D in Group „Non-Gambler” statistically significantly differs from zero: ;
- 4) The Mean of positive D in Group „Non-Gambler” statistically significantly differs from zero: .

For the study of the coincidence of the implicit and explicit measurement results correlation analysis was used, and also the percentage of coincidence was calculated between the results obtained with the implicit method (IAT) and explicit method.



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The correlation coefficients of Spearman, Kendall and Pearson between the results of implicit and explicit measurements (“D” and “Dependence”) were not statistically significant, both for the entire sample and for the individual groups “Gamblers” and “Non-Gamblers”.

A coincidence between the results was calculated taking in to account the coincidence of the following variables:

Dependence (neutral) and D(low); Dependence (high) and D(middle); Dependence (critical) and D(high). The percentage of the coincidence can be viewed in Table 1.

	Number of coincidence	Coincidence percentage
Total	24	48,0%
Non-Gamblers	13	52,0%
Gamblers	11	44,0%

Table 1. The coincidence percentage of the measurement results of IAT (D) and the explicit method (Dependence)

CONCLUSIONS AND DISCUSSION

1. It has been found that explicitly measured by GABS attitudes toward gambling were more expressed in the group of “Gamblers”.

This result coincides with our expectations, since the explicit attitudes are well understood by the person and are more amenable to human conscious control. According to the method of Breen and Zuckerman (GABS), the results can indicate of the “desire” to gamble and can show how much the individual “prefers” gambling. At the moment, the pathological addiction may not appear, but there may be specific cognitive risk factors that indicate the desire to become a problem gambler.

2. Also both positive and negative attitudes toward gambling were identified, measured with the help of SC-IAT, in the group of gamblers as well as in the group of non-players. Besides expressed negative attitudes toward the game were observed, also for the players who showed critical and high levels of gambling preference in the procedure GABS.

Similar results were received in Yi and Kantekar (2010) research. The groups were formed of students in a medium-sized university. According to the Canadian Problem Gambling Index (CPGI), participants were classified into four categories, based on the gambling risk, but, obviously, they were not problem gamblers. Individuals have simultaneously strong positive and negative attitudes toward the focal concept. It can be explained by the possibility that as gambling severity increases, both positive and negative automatic associations become stronger but at different rates. Yi suggests that as individuals become more vulnerable to gambling severity, not only positive but also negative automatic gambling associations become stronger. This is analogous to finding in the alcoholism domain that habitual drinkers had strong positive and negative associations of alcohol (Houben & Wiers, 2006).

It is possible to detect that the measured attitudes of gambling with SC-IAT are ambivalent. That is, the results of the implicit attitude measurements toward gambling must be treated with great caution. The existence of negative D-scores, obtained with the help of implicit measure, does not mean that there is no gambling addiction present. It rather suggest the internal desirability (being ready) to deal with the gambling addiction.

In the study Bravers, et. al. (2013, p.96, p.94) in problem gamblers negative implicit attitudes toward gambling were not found “Compared with non-gamblers, problem gamblers exhibit positive, but not negative, implicit attitudes toward gambling-related pictures”. “Whereas our gamblers experienced deleterious effects related to gambling, implicit attitude toward gambling remained positive, thus hampering attempts to quit gambling”.

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In our study, the sample consisted of social (non-problem) gamblers and non-gamblers. In the study of Yi, & Kantekar (2010) a sample of students was selected. It has been found that both of them can have negative attitudes in relation to gambling, measured implicitly. We can assume that the presence of negative attitudes provides a possibility of getting rid of even a strong gambling addiction.

3. It was found that the degree of both positive and negative, implicit attitudes are approximately the same in the group of social gamblers as well as in the group of non-gamblers.

4. A correlation between explicit and implicit measurement results was not found. There were about 50% coincidences identified of the attitudes toward gambling discovered with implicit and explicit methods. The results of correlation analysis and the calculated percentage of coincidences are consistent with the existing negative implicit attitudes toward gambling.

We agree with the explanations given in the article, Yi, & Kantekar (2010). There are at least two explanations for the lack of strong convergence between explicit and implicit attitudes toward gambling. First, this divergence may occur because response latency measures of attitudes have the property of being “uncontrollable” and thus suffer less social desirability bias than do self-report measures. On the other hand, an alternative explanation for this finding may be that the bipolar scale used in the self-report measures of attitudes is ill-suited to capture ambivalent attitudes. When responding to the bipolar scale, individuals who hold ambivalent attitudes tend to choose the midpoint, which is offered as the neutral attitude option. Thus, neutral attitudes reported by mid-to-high-risk gamblers may also be interpreted as ambivalent attitudes (Yi, & Kantekar, 2010).

According to the authors, the ability to measure attitudes toward gambling implicitly, gives an idea of the fact, how high are the chances for the individual either not to get addicted to the game, or get rid of already formed gambling addiction. If the implicit attitudes toward gambling are positive, according to Brewer, the chances decrease (Brewer, 2013).

In the study of Brewer, as well as in the present study, an insufficient number of observations was conducted for statistical analysis (e.g., frequency analysis). Perhaps it is appropriate to conduct a study under the conditions, where implicit attitudes change the sign. According to our assumptions, the presence of negative implicit attitudes is closely linked to the level and kind of gambling addiction.

In the further study, it is expected to take into account the choice of implicit measurement methods and the design of the study, according to gambling addiction's kinds and varieties.

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