

# THE GAMBLERS' TEMPERAMENT AND CHARACTER INVENTORY (TCI) PERSONALITY

## PROFILE

(short title: **The gamblers' TCI personality profile**)

Janiri L.\*, Martinotti G.\* \*\*, Dario T.\*, Schifano F.\*\*\*, Bria P.\*

\*Department of Psychiatry, Catholic University Medical School  
Largo A. Gemelli 8, 00168, Rome (I)

\*\* Division of Mental Health-Addictive Behaviour  
St. George's, , University of London (UK)

### **The gamblers' temperament and character inventory (TCI) personality profile. Janiri L., Martinotti G., Dario T., Schifano F., Bria P.**

**Abstract.** In a cross comparison study, the Cloninger's Temperament and Character Inventory (TCI) personality profile was administered to 28 probable pathological gamblers (PPGs), 32 non-pathological gamblers (non-PGs) and 65 controls. As a screening device, the validated Italian version of the South Oak Gambling Screen was administered to all subjects. Novelty Seeking (NS) values were higher in PPGs in comparison with both non-PGs ( $p < .05$ ) and controls ( $p < .001$ ). PPGs showed lower Self-Directedness (SD) and Cooperativeness (CO) values with respect to both non-PGs ( $p < .05$  and  $p = .001$ , respectively) and controls ( $p < .001$  and  $p = .001$ , respectively). The subsamples of PPGs reporting either a current substance misuse condition or a parental involvement in gambling/substance misuse showed higher NS ( $p = .01$ ) and lower CO ( $p = .005$ ) values than the remaining PPGs. A duration of problem gambling in excess of 20 years was associated with lower ( $p = .001$ ) CO values. Specific temperamental (NS) and character (SD; CO) dimensions differentiated PPGs from both non-PGs and controls; assessment of personality profile with the TCI may identify at-risk social gamblers.

**Keywords.** Gambling; South Oak Gambling Screen; Temperament and Character Inventory; novelty seeking; personality profile.

## INTRODUCTION

In taking into account the categorical approach, some studies have emphasised the association between specific (antisocial; avoidant; narcissistic; obsessive-compulsive) personality disorders and pathological gambling (Blaszczynsky & Steel, 1998; Blaszczynsky & McConaghy, 1992; Bland *et al.*, 1993; Specker *et al.*, 1996). In contrast with the categorical approach, the dimensional one assumes that a continuum exists between psychopathology and normal range; personality disorders are then seen as maladaptive extremes of normal personality dimensions (Le Bon, Basiaux & Strel, 2004). The variables most frequently reported to be associated with pathological gambling were sensation (Zuckerman, 1974) and novelty (Cloninger, 1987) seeking. Values of both these dimensions would be higher in alcoholics (Ravaja & Keltikangas-Jarvinen, 2001), opiate-dependents (Vukov *et al.*, 1995) and cocaine misusers (Ball *et al.*, 1995) with respect to controls. Moreover, higher sensation and intensity seeking values were reported in both casino/race-track bettors and in subjects betting on many different forms of gambling with respect to controls (Coventry & Brown, 1993; Nower, Derevensky & Gupta, 2004). In a university population, sensation seeking, intensity seeking, and risk taking behaviours, rated with the means of different instruments, discriminated between probable/pathological gamblers

and non-problem gamblers classified in accordance with the South Oak Gambling Screen (SOGS; Powell *et al.*, 1999). On the other hand, in the study of Petry (2001), the Zuckerman Sensation Seeking Scale (Zuckerman, 1994) did not significantly differentiate between controls, non-pathological gamblers/substance abusers and pathological gamblers/substance abusers, although the mean score was progressively higher in the second and third group.

The Cloninger's psychobiological model, based on a range of neuro-pharmacological, neuro-anatomical and biochemical data, assumes that both genetic and environmental factors have an influence on the development of a specific personality vulnerability that could lead, in turn, to develop either an addictive or an impulsive-compulsive disorder (Cloninger, 1986; Cloninger, Svrakic & Przybeck, 1993; Skodol & Oldham, 1996).

A dimensional assessment of personality of subjects affected from pathological gambling may have both diagnostic and treatment implications. The purpose of our study was to assess the Cloninger's Temperament and Character Inventory (TCI) personality profile of SOGS-based probable pathological gamblers (PPGs) and non pathological gamblers (non-PGs) in comparison with controls. We hypothesized that specific temperamental and character dimensions would differentiate PPGs from both non-PGs and controls.

## **METHODS**

Sixty actively gambling subjects (M/F 1.8/1, mean age  $39.3 \pm 15.5$  years; range: 18-65 years) were consecutively recruited for this study; 25 of them were attending a local self-help group (Gamblers Anonymous; GA) and 35 were recruited in a Bingo site in Rome. Controls were constituted by 65 subjects (matched for age, gender and education with the group of gamblers) recruited among the staff of the University General Hospital "A. Gemelli" in Rome. All of the control subjects recruited completed both the TCI and the SOGS (Lesieur & Blume, 1987). If SOGS scoring was different from zero and/or the largest amount range ever gambled on one day was more than 9 Euros/£6 (as rated in the item 2 of the SOGS), subjects were not included in the control group. Both study and control subjects gave an informed written consent to take part to the study, for which they did not receive any payment.

The SOGS is a 20-item questionnaire used to screen for pathological gambling. In terms of classification accuracy, in the original development study the SOGS was compared to the DSM-III-R (American Psychiatric Association, 1987) diagnosis of pathological gambling and demonstrated satisfactory hit rates among Gamblers Anonymous members, university students and hospital employees (Lesieur & Blume, 1987). The validated Italian version of the SOGS (Savron *et al.*, 2001) was administered to all subjects as a screening device to

identify pathological gamblers. All participants completed the SOGS reflecting the past 6 months. A cut-off score of 5 or more indicates that the respondent is likely to be a probable pathological gambler. The Temperament and Character Inventory (TCI; Cloninger *et al.*, 1994) contains 266 items designed to measure dimensions of the Cloninger's model of personality and it includes four temperamental (i.e.: Novelty Seeking, NS; Harm Avoidance, HA; Reward Dependence, RD; Persistence, PE) as well as three character (Self-Directedness, SD; Cooperativeness, CO; Self-Transcendence, ST) dimensions.

Study subjects were compared with controls with respect to each scale of the seven personality dimensions of TCI. Probable pathological gamblers and non-pathological gamblers were differentiated according to the SOGS results (i.e.: non-PGs were defined as those who had scores of 1 to 4, whilst subjects scoring 5 or more were included in the PPGs group). Probable pathological gamblers were then subgrouped according to presence of other addictive behaviours and family history for either substance misuse or gambling. Between-group differences were tested using t-test (two-tailed) for continuous variables. The dependence of TCI scores from socio-demographic variables (gender, age, marital and job status, family history) was evaluated with the means of the  $\eta^2$  index (its values may vary between 0 and 1; the higher the association between two variables, the closer to 1 the index values), which measures the dependence of quantitative variables from qualitative ones. This index was applied for both social and pathological gamblers. Pearson's linear correlation coefficient was applied to verify the correlations between gamblers' age and TCI scores and to check the internal correlations between the TCI scores across the different dimensions.

## **RESULTS**

According to the SOGS results, 32 subjects (30 were from the Bingo site) were classified as non-PGs and 28 (of whose 23 were from the GA group) as probable pathological gamblers (PPGs). There were no statistically significant differences between non-PGs and PPGs with respect to the sociodemographic variables considered (Table 1).

The TCI scores reported by non-PGs, PPGs and controls (C) are shown in table 2.

The correlations between subjects' age and TCI scores are shown in table 3. Subjects' gender was found to be related to RD values ( $F > M$ ;  $\eta^2 = 0.536$ ); level of education was associated to HA values (lower > higher levels;  $\eta^2 = 0.476$ ) whilst marital status was associated with ST scores (separated/divorced > married > single;  $\eta^2 = 0.590$ ).

The internal correlations between the TCI different scales are reported in table 4.

The subsample of PPGs reporting a substance misuse problem showed higher NS ( $p = .01$ ) and lower CO ( $p = .005$ ) values with respect to the remaining probable pathological gamblers; those who reported a family history of pathological gambling and/or of substance misuse showed higher NS ( $p < .001$ ) and lower CO ( $p = .001$ ) values with respect to the remaining PPGs. Subjects with a duration of problem gambling of less than 10 years showed higher HA ( $p = .001$ ) values with respect to those who had a longer duration of gambling, while subjects who reported a duration of problem gambling longer than 20 years showed lower CO ( $p = .001$ ) values with respect to those who had a shorter duration of problem gambling.

## **DISCUSSION**

The major value of this study is given by the comparative assessment of two different gamblers' (i.e.: non-pathological and probable pathological) populations with the means of the TCI, a research tool that, to the best of our knowledge, has never been applied before in such clinical setting.

In line with previous reports (Kim & Grant, 2001), PPGs were shown here to score higher on NS values than non-PGs and C. NS, as a personality dimension, is related to preference for activities involving chance and this is what endows gambling with novelty (Spinella, 2003). As described by Svrakic *et al.* (1993), NS highly correlates with the diagnoses of histrionic, antisocial and borderline personality disorders and high prevalence rates of these personality disorders have been described in gamblers (Black & Moyer, 1998).

Because of gamblers' pathological optimism concerning their chances to win at gambling activities, one could expect HA values to be higher in C compared to non-PGs and, above all, to PPGs. Moreover, since PE is a temperament character defined as the tendency to persevere despite frustration and fatigue and one of the most striking issues of gambling behaviour is that people continue to gamble despite persistent failure (Gilovich, 1983) one may well postulate that PE values were higher in PPGs compared to C. In our study, however, the only temperamental factor that was clearly able to differentiate PPGs from the other groups was NS. In fact, RD was able to significantly differentiate PPGs only from C but not from non-PGs.

Age resulted to be negatively correlated with NS. This is of interest, because adolescence/young adulthood constitutes also a risk factor for illicit drugs' experimentation, which is facilitated in those who present with high NS values (Dughiero, Schifano & Forza, 2001). On the other hand, ST (i.e.: self-transcendence; the only factor which discriminated between non-PGs and controls) values tended to increase with age. To this respect, Joukhador, Blaszczynski & Maccallum (2004) have suggested that irrational beliefs (i.e.: a strong conviction based on the erroneous perception of a cause-effect association between two independent events), are considered

to play an instrumental role in the maintenance of gambling behaviour. With regard to the TCI character dimensions, our data showed that SD and CO were significantly lower in PPGs with respect to both non-PGs and C.

May *et al.* (2004) found that problem gamblers scored significantly lower than controls on self-efficacy dimensions. On the other hand, low SD and uncooperativeness are the common characteristics of all categories of personality disorders (Gutierrez *et al.*, 2002) and SD was found to be lower in substance misusers with respect to controls (Le Bon, Basiaux & Streel, 2004). We found an association between gambling and cannabis misuse, reported by roughly 1 out of 5 PPGs and by 1 out of 8 non-PGs. Similarly, Toneatto & Brennan (2002), in a sample of treatment-seeking PPGs and non-PGs substance abusers, found that cannabis misuse was more frequently reported than alcohol, cocaine and opiates. In our sample of PPGs, high rates (about 18%) of parental involvement in gambling and substance misuse were reported, thus confirming previous reports (Hardoon, Gupta & Derevensky, 2004).

The levels of internal consistency of the TCI scales in both PPGs and non-PGs found here resulted to be similar to those found by Cloninger *et al.* (1993) in his Northern American general population.

In conclusion, evidence is given here that there are specific temperamental and character personality dimensions that are typical of probable pathological gambling. Consequently, the identification of a personality profile at risk for problem gambling may have a preventative value. Personality dimensions (and especially NS) are important predictors of outcome (Leblond, Ladouceur & Blaszczynski, 2003) and may constitute possible targets for specific treatment approaches (Grant, Kim, & Potenza, 2003).

**Acknowledgments:** This study was partially supported by grants (N. 7021560 and N. 7021566) of the Italian Ministry for the University and Scientific Research. We wish to thank both Dr. Alessandra Ruggeri for her helpful contribution in carrying out the statistical analysis of data and all of the participants who generously gave their time and made this study possible.

## REFERENCES

Ball, S. A., Carroll, K. M., Babor, T. F., Rousanville, B. J. (1995). Subtypes of cocaine abusers: support for a type A/type B distinction. *Journal of Consulting Clinical Psychology* 63: 115-124.

Black, D. W. and Moyer, T. (1998). Clinical features and psychiatric comorbidity of subjects with pathological gambling behavior. *Psychiatric Services* 49: 1434-1439.

Bland, R., Newman, S., Orn, H., Stebelsky, G. (1993). Epidemiology of pathological gambling in Edmonton. *Canadian Journal of Psychiatry* 38: 108-112.

Blaszczynsky, A. and McConaghy, N. (1992). Pathological gambling and criminal behaviours. *Report to the Australian Institute of Criminology*. Criminology Research Council, Canberra.

Blaszczynsky, A. and Steel, Z. (1998). Personality disorders among pathological gamblers. *Journal of Gambling Studies* 14(1): 51-71.

Cloninger, C. R. (1986). A unified biosocial theory of personality and its role in the development of anxiety states. *Psychiatric Developments* 3: 167-226.

Cloninger, C. R., 1987. A systematic method for clinical description and classification of personality variants. *Archives of General Psychiatry* 44, pp. 573-588.

Cloninger, C. R., Svrakic, D. M. and Przybeck, T. R. (1993). A psychobiological model of temperament and character. *Archives of General Psychiatry* 50: 975-990.

Cloninger, C. R., Przybeck, T. R., Svrakic, D. M., Wetzel, R. D. (1994). The Temperament and Character Inventory (TCI): a guide to its development and use. St. Louis, Missouri: Center for Psychobiology of Personality.

Coventry, K. R. and Brown, R. I. (1993). Sensation seeking, gambling and gambling addictions. *Addiction* 88(4): 341-354.

Dughiero, G., Schifano, F. and Forza, G. (2001). Personality dimensions and psychopathological profiles of ecstasy users. *Human Psychopharmacology Clinical and Experimental* 16: 635-639.

Gilovich, T. 1983. Biased evaluation and persistence in gambling. *Journal of Personality and Social Psychology* 44: 1110-1126.

Grant, J. E., Kim, S. W. and Potenza, M. N. (2003). Advances in the pharmacological treatment of pathological gambling. *Journal of Gambling Studies* 19: 85-109.

Gutierrez, F., Sangorrin, J., Martin-Santos, R., Torres, X., Torrens, M. (2002). Measuring the core features of personality disorders in substance abusers using the Temperament and Character Inventory (TCI). *Journal of Personality Disorders* 16: 344-359.

Hardoon, K. K., Gupta, R. and Derevensky, J. L. (2004). Psychosocial variables associated with adolescent gambling. *Psychology of Addictive Behaviour* 18: 170-179.

Joukhador, J., Blaszczynski, A. and Maccallum, F. (2004). Superstitious beliefs in gambling among problem and non-problem gamblers: preliminary data. *Journal of Gambling Studies* 20: 171-180.

Kim, S. W. and Grant, J. E. (2001). Personality dimensions in pathological gambling disorder and obsessive-compulsive disorder. *Psychiatry Research* 104: 205-212.

Leblond, J., Ladouceur, R. and Blaszczynski, A. (2003). Which pathological gamblers will complete treatment? *British Journal of Clinical Psychology* 42: 205-209.

Le Bon, O., Basiaux, P. and Streel, E. (2004). Personality profile and drug of choice: a multivariate analysis using Cloninger's TCI on heroin addicts, alcoholics, and a random population group. *Drug and Alcohol Dependence* 73: 175-182.

Lesieur, H. R. and Blume, S. B. (1987). The South Oaks Gambling Screen (SOGS): a new instrument for the identification of pathological gamblers. *American Journal of Psychiatry* 144: 1184-1188.

Nower, L., Derevensky, J. L. and Gupta, R. (2004). The relationship of impulsivity, sensation seeking, coping, and substance use in youth gamblers. *Psychology of Addictive Behaviour* 18: 49-55.

Petry, N. M. (2001). Substance abuse, pathological gambling, and impulsiveness. *Drug and Alcohol Dependence* 63: 29-38.

Powell, J., Hardoon, K., Derevensky, J. L., Gupta, R. (1999). Gambling and risk-taking behavior among university students. *Substance Use and Misuse* 34(8): 1167-1184.

Ravaja, N. and Keltikangas-Jarvinen K. (2001). Cloninger's temperament and character dimensions in young adulthood and their relation to characteristics of parental alcohol use and smoking. *Journal of Studies on Alcohol* 62: 98-104.

Savron, G., Pitti, P. and De Luca, R. (2001). Psicopatologia e gioco d'azzardo: Uno studio preliminare su un campione di Giocatori d'Azzardo Patologici. *Rivista di Psichiatria* 36: 14-21.

Skodol, A. E. and Oldham, J. M. (1996). Phenomenology, differential diagnosis, and comorbidity of the impulsive-compulsive spectrum of disorders. In: Oldham, J.M., Hollander, E., Skodol, A.E., eds. *Impulsivity and Compulsivity*. Washington, DC: American Psychiatric Press.

Specker, S. M., Carlson, G. A. and Edmonson, K. M. (1996). Psychopathology in pathological gamblers seeking treatment. *Journal of Gambling Studies* 12: 67-82.

Spinella, M. (2003). Evolutionary mismatch, neural reward circuits, and pathological gambling. *International Journal of Neuroscience* 113: 503-512.

Svrakic, D. M., Whitehead, C., Przybeck, T. R., Cloninger, C. R. (1993). Differential diagnosis of personality disorders by the seven-factor model of temperament and character. *Archives of General Psychiatry* 50: 991-999.



Toneatto, T. and Brennan, J. (2002). Pathological gambling in treatment-seeking substance abusers. *Addictive Behaviors* 27: 465-469.

Vukov, M., Baba-Milkic, N., Lecic, D., Mijalkovic, S., Marinkovic, J. (1995). Personality dimensions of opiate addicts. *Acta Psychiatrica Scandinavica* 91: 103-107.

Zuckerman, M. (1974). The sensation seeking motive. In: Maher, B.A., ed. *Progress in Experimental Personality Research*. New York: Academic Press.

Zuckerman, M. (1994). *Behavioural Expressions and Biosocial Bases of Sensation Seeking*. New York: Cambridge University Press.