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Abstract

Objective: Pathological gambling (PG) and eating disorders (ED) rarely co-occur. We explored the prevalence of lifetime PG in ED, compared severity of ED symptoms, personality traits, and psychopathological profiles across individuals with ED and PG (ED + PG) and without PG (ED-PG). Finally, we assessed the incremental predictive value of gender on the presentation of a comorbid PG. Method: A total sample of 1681 consecutively admitted ED patients (1576 females and 105 males), participated in the current study (25 ED + PG and 1656 ED-PG). All participants were diagnosed according to DSM-IV criteria. Assessment measures included the Symptom Checklist and the Temperament and Character Inventory-Revised, as well as other clinical and psychopathological indices. Results: The observed lifetime prevalence of PG was 1.49%. ED subtype was associated with lifetime PG ($p = .003$), with PG being more frequent in binge eating disorder (5.7%). ED + PG was more prevalent in males than in females (16% vs. 1.26%, respectively). Additionally, ED + PG patients exhibited more impulsive behaviours, lower impulse regulation and higher novelty seeking. Best predictors of ED + PG were novelty seeking (OR 1.030, $p = .035$), sex (OR 3.295, $p = .048$) and BMI (OR 1.081, $p = .005$). Conclusions: Some personality traits (novelty seeking), being male and higher BMI are strongly related to the presence of lifetime PG in specific ED subtypes (namely binge eating disorder).

1. Introduction

Pathological gambling (PG) is a disorder characterized by persistent and recurrent maladaptive patterns of gambling behavior and is classified as an impulse control disorder (ICD) in DSM-IV [1]. Impulsivity has been identified as a trait that underlies vulnerability to binge eating, problem drinking, and problem gambling [2].

In individuals with eating disorders (ED), lifetime comorbid ICDs have a prevalence of 16–23.8%, with the most frequently reported disorders being compulsive buying and kleptomania [3–5]. Tobacco and drug use is also reported to be elevated in eating disorders [6]. Individuals suffering from anorexia nervosa (AN) and bulimia nervosa (BN) are more prone to committing suicide [7,8]. Suicide is reported to be the major cause of death in AN [9] and to have 26.9% lifetime prevalence in BN, being influenced by the combination of internalizing personality traits and impulsivity [10].

A substantial proportion of bulimic women (20%) exhibit problems with impulse control that extend beyond the impulsivity inherent in binge eating: they display other impulsive behaviors that may have serious medical compli- cations and legal ramifications (e.g., stealing, self-injury, attempted suicide, drug and alcohol abuse, laxative abuse, and sexual promiscuity) [11].

The presence of multi-impulsivity in individuals with BN is associated with more severe clinical features, such as concurrent depressive and anxious symptoms, poor global functioning, and higher prevalence of borderline personality disorder [12]. Genetic findings indicate that women with BN who are GG homozygotes on the _1438G/A promoter polymorphism are more impulsive and have lower sensitivity to post-synaptic serotonin activation. These findings associate the GG genotype with impulsivity and post-synaptic 5-HT function in women with active BN [13].

An examination of the relationship between ED and PG reveals that although there are shared personality traits between individuals with BN and PG when compared with healthy controls, there are certain sex- and diagnostic- specific personality traits that make BN different from other ICDs [14]. It appears that gambling is associated with higher impulsivity in men, whereas in women, binge eating is strongly driven by the desire to relieve negative affect [2]. However, few studies have addressed the link between BN and PG, nor has the prevalence of PG in ED been ascertained.

The goals of the present study were: 1) to identify the prevalence of lifetime PG in a clinical sample of individuals with ED diagnostic subtypes; 2) to analyze whether ED patients with lifetime PG exhibit more severe eating disorder symptomatology, more maladaptive personality profiles and greater general psychopathology than ED patients without PG; 3) and 4) to assess the incremental predictive value of gender on the presentation of a comorbid PG.

We hypothesized that the prevalence of PG in an ED sample will be greater than in general population, given the shared vulnerability factors between both disorders, and it will be especially higher in BN and BED subtypes. We also hypothesized that those patients who present lifetime PG will show greater clinical severity. Finally, in agreement with the literature, we also hypothesized that PG lifetime in ED patients will be a gender specific trait, being more prevalent in ED males.

2. Methods

2.1. Participants

A total sample of 1681 consecutively admitted ED patients (1576 females and 105 males), diagnosed according to DSM-IV criteria (SCID-I) [15], participated in the current study. Diagnostic distribution was as follows: 354 AN; 783 BN; 105 BED; 439 eating disorder not otherwise specified (EDNOS). Participants were consecutive referrals to the

Department of Psychiatry of Bellvitge University Hospital in Barcelona.

Individuals were excluded from the analyses if they had missing values for any diagnostic items. Participants were recruited between May 2002 and April 2008. The Ethics Committee of the hospital approved the study and informed consent was obtained from all participants.

2.2. Instruments

2.2.1. General measures

2.2.1.1. Temperament and Character Inventory –Revised (TCI-R). The TCI-R [16] is a 240-item questionnaire with a five-point Likert scale format. This questionnaire, as in the original TCI version [17], is a reliable and valid measure of four temperament (Harm Avoidance, Novelty Seeking, Reward Dependence and Persistence) and three character dimensions (Self-Directedness, Cooperativeness and Self-Transcendence) of personality. Performance of the Spanish versions of both the original questionnaire [18] and the revised version [19] have been well-documented. Reliability of the seven dimensions in the Spanish adaptation ranged between 0.77 and 0.84.

2.2.1.2. SymptomChecklist-90 items-Revised (SCL-90-R). The SCL-90-R [20] is a widely used 90-item scale for assessing self-reported psychological distress and psycho- pathology. The test is usually scored on nine primary symptom dimensions: somatization, obsessive-compulsive, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation and psychoticism, in addition to three global indices: Global Severity Index (GSI), Positive Symptom Total (PST), and Positive Symptom Distress Index (PSDI). The Spanish validation of this scale [21] yielded a good reliability of the scales (internal consistency) ranging from 0.81 to 0.90, withtest re-test reliability ranging from 0.78 to 0.90.

2.2.2. Diagnostic-specific additional measures

2.2.2.1. Eating Disorders Inventory-2 (EDI-2). This inventory is a reliable and valid 91-item multidimensional self-report questionnaire with a 6-points format response (ranging from Never to Always) that measures several characteristics of AN and BN [22]. It has been validated in a Spanish population [23] with a mean internal consistency of (alpha) 0.63.

2.2.2.2. Evaluation of eating disorders and comorbid pathological gambling and substance abuse. The patients were assessed with a face-to-face structured clinical interview, covering lifetime and current eating disorders, pathological gambling, and substance abuse (drug and alcohol), with the structured clinical interview for DSM-IV axis I disorders, SCID-I. Demographic-clinical information

2.3. Procedures

Experienced psychologists and psychiatrists conducted the structured face-to-face interviews outlined above. Lifetime pathological gambling and familial psychopathol- ogy were also assessed at this time. In addition, participants were weighed and measured by the interviewers, before the initiation of treatment.

2.4. Statistical analyses

The statistical analysis was carried out with SPSS 17.0.2 for Windows. First, prevalence of lifetime history of pathological gambling was estimated for ED patients and prevalence ratios (PR) were computed for

comparing ED subtypes. Next, the eating disorder symptoms (EAT and EDI measures), general psychopathology (SCL-90-R scales), and personality profiles (TCI-R scores) were compared between pure ED patients and comorbid ED + PG patients, through analysis of variance procedures (ANOVA) adjusted by the subjects' sex and age. Finally, hierarchical multiple and logistic regressions valued the incremental predictive accuracy of gender on the presence of a comorbid ED + PG diagnosis and on the severity of the ED disorder (total EAT and EDI scores). These models were adjusted including socio-demographical and psychometrical mea- sures in the first step and the patient's gender in the second step. The incremental accuracy of prediction was estimated with the changes in R2 between first and second steps (Nagelkerke's R2 in the logistic regressions).

Due to the multiple statistical tests, type-I error was controlled through Bonferroni-Holm's correction [24].

3. Results

3.1. Prevalence of pathological gambling in a clinical sample of eating disordered patients

The total ED sample in this study consisted 1656 pure ED patients and 25 ED + PG patients. The observed lifetime prevalence of PG was 1.49% (95% confidence interval [CI], 1%-2.19%). There were statistically significant differences in BMI found between ED and ED + PG groups (p b .001), indicating that ED + PG patients had signifi- cantly higher BMI. Furthermore, premorbid obesity was significantly higher in ED + PG than in ED patients (19.5% vs. 57.9%, p b .001), and childhood obesity showed a less significant but similar pattern (7.9% vs. 26.7%, p b .05) (Table 1).

3.2. PG presence and ED diagnostic subtype

Table 2 shows the distribution of the ED subtypes associated with lifetime PG (p = .003). The greatest association was found between PG and BED [5.7% (95% CI, 2.65–11.9%)]. PG prevalence in BN and EDNOS was found to be 1.28% and 1.59%, respectively. The lowest prevalence in the ED subtypes was found in AN (0.57%). Table 3 shows the comparison of the prevalence of PG in the four subtypes of ED. Statistically significant differences were found in AN vs. BED (p b .05, PR = 10.1) and BN vs. BED (p b .05, PR = 4.47).

3.3. Comparison between ED patients with and without lifetime PG

Between-group comparisons showed that the best pre- dictors of ED + PG were novelty seeking (OR 1.030, p = .035), sex (OR 3.295, p = .048) and BMI (OR 1.081, p = .005). In the comparison of general and eating psychopa- thology the significant differences were found in impulse regulation (p b .005) as measured by EDI, anxiety (p b .05) as measured by SCL-90-R, and novelty seeking, self- directedness (both p b .005) and cooperativeness (p b .05) as measured by TCI-R. ED + PG patients exhibited more extreme profiles on all the subscales of EDI, TCI-R and SCL-90-R. In general, ED + PG patients exhibited more impulsive behaviors [substance-abuse disorders, additional ICDs (namely kleptomania and compulsive buying)], lower impulse regulation and higher novelty seeking (Table 4). 3.4. Comparison between BN/BED patients with and without lifetime PG

As shown in Appendix 1 (supplementary material), when comparing clinical presentation of BN/BED with and without lifetime PG, the former showed higher impulsive- ness (measured by means of EDI impulse regulation subscale, p b .001), and higher both anxiety (mean scores on SCL90-R phobic anxiety, p b .05) and general psycho- pathology (measured by the SCL-90-R total score, p b .05). Furthermore, the BN/BED with lifetime PG, showed differential personality traits, such as higher novelty seeking (p b .007), lower self-directedness (p b .001) and lower cooperativeness (p b .009), as measured by TCI-R (Table 5).

3.5. Assessment of incremental predictive value of gender on the presentation of a comorbid PG

The results of the 2nd step in the hierarchical logistic regression show that ED + PG was more prevalent in males than in females (16% vs. 1.26%, respectively).

4. Discussion

The main objective of this study was to identify the prevalence of lifetime PG in a clinical sample of individuals with EDs; and to analyze the association between the presence of PG and subtypes and severity of EDs, and psychopathological and personality characteristics. In addi- tion, we examined whether gender

could be related to the presence of PG.

4.1. Prevalence of PG in ED clinical samples

Although many studies of EDs have explored impulsivity as a behavior or as a personality trait, the relation between EDs and diagnosed impulse control disorders, specifically pathological gambling has rarely been investigated [6,14]. The few studies that have studied impulse control disorders in individuals with EDs report a lifetime prevalence ranging from 3% to 24% [4,5]. However, if we focus solely on PG, the rates are significantly lower ranging between 0.3% and 0.88% [4]. Lifetime prevalence of PG in the general adult population ranges between 0.5 and 10% in North America [25–27], according to DSM-IV criteria, and similar figures have been reported in Europe [28]. In this study we have obtained the rate of 1.49%, which is somewhat greater than what has been obtained in other studies and more closer to the rate observed in the general population. An explanation to this discrepancy in the results might be that in previous studies [4,5] males were excluded from the analyzed ED sample.

4.2. PG and gender in ED samples

Gambling has traditionally been viewed as a male leisure activity. One culturally based explanation is related to the social acceptance of this form of entertainment. Epidemio- logical studies aimed at evaluating gender differences have shown that regular gambling patterns are more prevalent in men, and that rates of PG are double for males [29–33]. Our finding of higher prevalence of comorbidity between ED and PG in males than in females (16% vs. 1.26%, respectively), is therefore, in keeping with findings of previous studies. 4.3. PG and ED subtype

In our sample, specific ED subtypes, namely BED and BN, were more frequently associated with lifetime PG. As suggested in previous studies [34,35] these findings support again the idea that ED categories are heterogeneous and frequently only based in the behavioral symptom presenta- tion (i.e. binge/vomiting frequency, BMI, dieting behav- iour), when considering classification issues. For further nosological purposes, broader pathophyisiological criteria should be considered. In the case of BN and BED, the results obtained of higher prevalence of PG, as the case of other externalizing symptoms and more impulsive personality traits, than in AN, is a reflection of differential etiopatho- logical mechanisms involved. Neuropsychological and neuroimaging studies [36,37], but also differential response to pharmacological treatments, may support this idea and the involvement of differential brain circuitries when compared BN/BED and AN. The former group is even suggested to have similar neural activation patterns in reward system than addictive behaviours [38].

In general, ED + PG patients exhibited more impulsive behaviours [substance-abuse disorders and additional ICD (namely kleptomania and compulsive buying)], lower impulse regulation and higher novelty seeking. In previous studies, the presence of an ICD was associated with significantly greater severity of the ED, higher degree of psychopathology and maladaptive personality traits (elevat- ed impulsivity and novelty seeking, harm avoidance, neuroticism and low self-directedness), even after control- ling for ED subtype [4,5,14]. Current findings are consistent with the above, and further corroborate the observation that the presence of PG is commonly associated with greater overall severity of illness [39,40].

4.4. Predictors of PG in ED sample

Our results indicate that the best predictors of ED + PG were sex, BMI and novelty seeking. Several studies have shown a low prevalence of PG in ED samples [4,5,41], which could imply different vulnerability factors for the two disorders, such as sociodemographic variables related to gender and age or personality traits, among others. One important epidemiologic consideration is the impact of gender on PG. The majority of studies demonstrate that males are more likely to present regular gambling behaviour, and related psychiatric problems such as antisocial personality disorder, alcoholism, and tobacco dependence [31,32]. Therefore, being male has been considered as a well-established risk factor for the development of PG [42]. Furthermore, it appears that males are more likely to gamble as youths [43–46], and that the age of onset for PG in females is over 40 years of age [31]. This could be part of the explanation for the lower prevalence (ED + PG) in females in our sample. As suggested in previous studies [5], it could be important to use prospective studies to assess whether ED females are at risk of developing PG at an older age and to explore the manner in which the emergence of symptoms of one disorder influence the emergence of

symptoms of the other. Additionally, and as described in previous studies [34,47], there is a positive association between BED and BMI. Our results suggest that the larger the BMI, the greater the probability of presenting or having presented with a lifetime diagnosis of PG. This finding corroborates previous work establishing an association between PG and BED. Engwall, Hunter and Steinberg [48] found gambling problems to be associated with BED and greater efforts at weight control in a sample of university students, whereas Boughton and Falenchuk [49] noted a positive relationship between problematic gambling, BED, and other impulse control behaviors such as compulsive buying.

The relationship between the temperament trait of novelty seeking and ED (namely BN and BED) has been studied extensively [4,5,14]. In EDs, more precisely in bulimia, and in ICD, like PG, novelty seeking appears to be linked to certain personality dimensions, and may represent a common vulnerability factor. In fact, an increase in genetically predisposed temperament traits like novelty seeking and impulsivity has been noted in PG and ED [36,50]. Thus our results are in agreement with those described previously, and confirm a positive association between specific temperament traits and the risk of suffering from an ED or PG.

In summary, our data supports the postulated hypotheses and the existence of certain similarities in personality features between ED and PG, especially in a limited subgroup of individuals consisting mainly of males with an increased BMI (namely, BED) and of those with a common temperament factor related to impulsivity and risk seeking [51,52]. Although individuals with both disorders may share deficits of inhibitory control, triggering and maintaining factors would differ for each maladaptive behavior (i.e. weight history and bodily dissatisfaction versus winning money) [53–55].

5. Conclusions

Pathological gambling is characterized by a failure to resist an impulse, drive, or temptation to perform an act that is harmful to self or others. Researchers have hypothesized that ICDs lie along an impulsive-compulsive spectrum. This clinical description might also be applicable to some symptoms of eating disorders, especially bulimia nervosa

and binge eating disorder. Despite the acknowledgement of shared vulnerabilities, the relationship between ICDs and ED has been rarely explored. The fact that PG is more frequent in males whereas ED are more frequent in women, may explain why few studies have analyzed the comorbidity between them. Although we found a PG prevalence among ED patients comparable to the rate observed in the general population, when considering gender and ED subtype, we observed a higher than expected prevalence of PG in males with BED. Furthermore, our results indicated that the best predictors of ED + PG were sex, BMI and novelty seeking. To summarize, our findings suggest the need to explore comorbid impulse control disorders in patients with ED to adapt the treatment to the clinical characteristics of individual patients. Unrecognized and untreated PG could have a negative effect on the course and response to treatment in ED.

5.1. Limitations

Certain limitations of the current study should be considered in interpreting findings. First, we relied on participants' retrospective reports of lifetime diagnosis. Second, the cross-sectional design does not allow us to determine causality of the variables assessed. Nonetheless, we found a lifetime prevalence of PG in ED of 1.49%, and a stronger association between PG and BED when compared to other ED subtypes. We also ascertained that ED + PG was more prevalent in males and that ED + PG patients exhibited more impulsive behaviours, lower impulse regulation and higher novelty seeking. On the whole the best predictors of ED + PG are novelty seeking, sex and BMI.

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Table 1

	Pure ED (N = 1656)	Comorbid ED + PG (N = 25)	p-value
Gender: male; %	6.1	16.0	.066
Age (years); *mean (SD)*	26.23 (7.5)	27.60 (7.3)	.366
Age of onset of the dis. (yrs); *mean (SD)*	19.31 (6.3)	19.00 (7.9)	.818
Duration of the disorder (yrs); *mean (SD)*	6.95 (6.1)	8.22 (6.5)	.324
Number of previous treatments; *mean (SD)*	0.89 (1.2)	0.50 (1.1)	.108
Weekly binge episodes; *mean (SD)*	4.63 (6.5)	4.96 (6.1)	.805
Weekly vomiting episodes; *mean (SD)*	5.22 (7.9)	3.68 (5.9)	.335
Weekly laxatives abuse; *mean (SD)*	3.69 (13.7)	0.79 (2.4)	.302
Weekly diuretics abuse; *mean (SD)*	1.28 (5.3)	.84 (3.1)	.683
Body mass index; *mean (SD)*	22.3 (6.4)	27.3 (8.8)	<.0005
Premorbid obesity; %	19.5	57.9	<.0005
Childhood obesity; %	7.9	26.7	.028
Suicide attempts; %	22.0	20.0	.811
Stealing; %	12.9	24.0	.126
Self-harm; %	30.4	40.0	.299
Kleptomania; %	2.7	16.0	.005
Compulsive buying; %	16.4	52.2	<.0005
Alcohol abuse; %	11.1	32.0	.005
Other drugs use; %	19.0	40.0	.018

Table 2

TOTAL ED (N = 1681)	AN (N = 354)	BN (N = 783)	BED (N = 105)	EDNOS (N = 439)	p-value
1.49% (1.00; 2.19)	0.57% (0.15; 2.04)	1.28% (0.70; 2.33)	5.71% (2.65; 11.9)	1.59% (0.77; 3.25)	.003

Table 3

	*p-value	PR (95% CI)	
AN versus BN	0.722	2.29	(0.50; 10.40)
AN versus BED	0.012	10.1	(2.07; 49.4)
AN versus EDNOS	0.600	2.82	(.59; 13.5)
BN versus BED	0.035	4.47	(1.66; 12.1)
BN versus EDNOS	0.800	1.25	(0.48; 3.26)
BED versus EDNOS	0.096	3.59	(1.23; 10.4)

Table 4

	Mean (SD)				ANOVA adjusted by sex and age	
	Pure ED (N = 1656)		Comorbid ED + PG (N = 25)		*p*	Mean difference (95% CI)
EAT: Total score	49.52	(27.9)	44.48	(25.1)	.565	3.51 (−8.4; 15.5)
EDI: Drive for thinness	13.02	(6.2)	13.84	(6.8)	.960	−1.24 (−3.7; 1.2)
EDI: Body dissatisfaction	16.16	(8.1)	19.12	(8.0)	.240	−3.51 (−6.7; -0.3)
EDI: Interoceptive awareness	11.46	(6.7)	14.40	(7.6)	.108	−3.36 (−6.0; -0.7)
EDI: Bulimia	7.00	(5.7)	9.88	(6.8)	.080	−3.04 (−5.3; -0.8)
EDI: Interpersonal distrust	6.00	(4.6)	6.48	(5.4)	.960	−0.51 (−2.4; 1.3)
EDI: Ineffectiveness	11.06	(7.1)	13.56	(5.7)	.240	−2.89 (−5.7; -0.1)
EDI: Maturity fears	8.09	(5.7)	10.52	(6.7)	.240	−2.47 (−4.7; -0.2)
EDI: Perfectionism	5.64	(4.4)	6.64	(5.4)	.920	−1.07 (−2.8; 0.7)
EDI: Impulse regulation	7.06	(6.0)	11.44	(8.5)	**.002***	−4.60 (−7.0; -2.2)
EDI: Asceticism	6.97	(4.3)	7.56	(3.9)	.960	−0.70 (−2.4; 1.0)
EDI: Social insecurity	8.08	(5.1)	10.08	(5.1)	.240	−2.16 (−4.2; -0.2)
EDI: Total score	100.2	(43.8)	123.5	(48.3)	**.044***	−25.71 (−43.0; -8.5)
SCL-90-R: Somatization	1.78	(1.1)	2.30	(0.9)	.077	−0.55 (−0.9; -0.1)
SCL-90-R: Obsessive-compulsive	1.93	(0.9)	2.30	(0.8)	.198	−0.39 (−0.8; 0.0)
SCL-90-R: Interpersonal sensitivity	2.04	(1.1)	2.33	(0.9)	.216	−0.35 (−0.7; 0.3)
SCL-90-R: Depression	2.23	(0.9)	2.53	(0.8)	.216	−0.33 (−0.7; 0.0)
SCL-90-R: Anxiety	1.78	(0.9)	2.33	(1.2)	**.036***	−0.58 (−1.0; -0.2)
SCL-90-R: Hostility	1.53	(1.0)	1.79	(1.1)	.216	−0.28 (−0.7; 0.1)
SCL-90-R: Phobic anxiety	1.11	(1.0)	1.64	(1.2)	.077	−0.56 (−1.0; -0.2)
SCL-90-R: Paranoid ideation	1.53	(0.9)	1.88	(0.9)	.200	−0.37 (−0.7; 0.0)
SCL-90-R: Psychoticism	1.38	(0.8)	1.81	(0.9)	.077	−0.46 (−0.8; -0.1)
SCL-90-R: GSI total score	1.78	(0.8)	2.18	(0.8)	.077	−0.43 (−0.7; -0.1)
SCL-90-R: PST total store	65.0	(18.7)	72.7	(16.6)	.198	−8.29 (−15.9; -0.7)
SCL-90-R: PSDI total score	2.37	(0.9)	2.64	(0.6)	.091	−0.31 (−0.6; -0.1)
TCI-R: Novelty seeking	102.4	(16.3)	113.9	(19.2)	**.003***	−11.64 (−18.2; -5.1)
TCI-R: Harm avoidance	116.9	(19.9)	121.8	(18.6)	.636	−5.70 (−13.6; 2.2)
TCI-R: Reward dependence	103.0	(15.9)	104.4	(18.2)	1.000	−1.72 (−8.1; 4.7)
TCI-R: Persistence	109.7	(21.3)	109.5	(23.7)	1.000	−0.02 (−8.6; 8.6)
TCI-R: Self-directedness	116.3	(21.9)	100.8	(23.5)	**.002***	16.27 (7.5; 25.0)
TCI-R: Cooperativeness	134.5	(18.1)	124.5	(19.0)	**.045***	9.57 (2.4; 16.8)
TCI-R: Self-transcendence	65.82	(14.9)	65.96	(18.3)	1.000	−0.23 (−6.3; 5.8)

Table 5

Comorbidity of ED + PG	OR	p-value	Change R^2	p-value
Age (years)	.991	.776	.143	<.0005
Body mass index (kg/m^2)	1.081	.005		
TCI-R: Novelty seeking	1.030	.035		
TCI-R: Harm avoidance	1.005	.736		
TCI-R: Reward dependence	1.016	.309		
TCI-R: Persistence	1.015	.165		
TCI-R: Self-directedness	.975	.092		
TCI-R: Cooperativeness	.986	.308		
TCI-R: Self-transcendence	.985	.312		
Sex (male)	3.295	.048	.157	.073