The Role of Personality in the Prediction of Treatment Outcome in Pathological Gamblers: A Follow-Up Study

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The aim of the present study was to determine which domains in NEO Personality Inventory–Revised would predict relapse and dropout in treatment-seeking slot-machine pathological gamblers after 1-year follow-up. The NEO PI-R was completed by 73 consecutive treatment-seeking outpatients before they began an open program of individual cognitive–behavioral therapy. Twelve months after starting treatment, patients were categorized in groups as abstinent versus relapsed or completers versus dropouts. At 1-year follow-up, 29% of patients were abstinent, and 48% had completed treatment. Those who had relapsed showed higher significant scores on Neuroticism and lower scores on Conscientiousness. The dropout group scored significantly higher on Neuroticism and lower on Agreeableness and Conscientiousness than the completer group. Low scores on Conscientiousness emerged as a significant predictor of relapse; while low scores on Conscientiousness and Agreeableness were significant predictors of dropout. It seems as if low Conscientiousness could be considered as a predictor of treatment failure measured by either relapses or dropouts, whereas, low Agreeableness seems to be a prognostic domain specifically for dropouts. Pathological gamblers with lower Conscientiousness and lower Agreeableness seem to be at risk of prematurely dropping out of treatment. Our findings support the importance of individual differences in personality on therapy outcomes. The NEO PI–R may constitute an important tool to identify treatment-seeking pathological gamblers who may be at risk of relapsing or dropping out of treatment.

Keywords: personality, pathological gambling, relapse, dropout, NEO PI–R

Pathological gambling (PG) is a disorder characterized by being unable to resist impulses to gamble that can lead to severe personal and social consequences. It is categorized as an impulse control disorder in the Diagnostic and Statistical Manual for Mental Disorders (4th ed., text rev.; DSM–IV–TR; American Psychiatric Association, 2000). Estimates indicate that 70%–90% of North Americans have engaged in some form of gambling activity (Raylu & Oei, 2002), but epidemiological surveys place the prevalence rate of PG at 1%–2% of the general population (Petry, 2005), suggesting that the majority of individuals who gamble do not develop PG. The discrepancy between those who gamble and do not develop PG and those who gamble and do has led researchers to search for vulnerability factors related to this disorder. Individual differences in personality may play an important role in explaining the risk of developing and maintaining PG, as personality traits are stable and enduring characteristics of behavior.

A few studies have focused on personality variables as a possible vulnerability in PG, comparing pathological gamblers (PGs) with nonpathological gamblers (NPGs), or those who seek treatment with those who do not, or pathological gamblers with other control groups. The majority of these few studies have been conducted with the five-factor model of personality (FFM) using the Revised NEO Personality Inventory (NEO PI–R; Costa & McCrae, 1992) as the assessment instrument. Bagby et al. (2007) in a nontreatment-seeking group compared PGs with NPGs, finding that PGs had higher Neuroticism, lower Conscientiousness,
and lower scores on the Trust facet of Agreeableness. In another study, Kaare, Möttös, and Konstabel (2009) compared PGs with NPGs in a treatment-seeking group and found that the former scored higher on Neuroticism and lower on Conscientiousness. Myrseth, Pallesen, Molde, Johnsen, and Lorvik (2009) compared treatment-seeking PGs to NPGs, once again finding higher scores on Neuroticism and lower scores on Conscientiousness, Agreeableness, Extraversion, and Openness. Finally, in a recent study with university students, MacLaren, Best, Dixon, and Harrigan (2011) found that the scores for potential addictive self-defeating behavior on a gambling scale correlated positively with high Neuroticism and low Agreeableness and Conscientiousness. All of these studies conducted with the NEO PI–R point out that the personality profile of PGs seems to be characterized by high Neuroticism, low Conscientiousness, and a tendency toward low scores on Agreeableness or its facets.

Few studies have focused on the personality profile of PGs. However, still fewer have focused on which personality traits would predict treatment outcome. Although the DSM–IV–TR characterizes PG as a progressive and chronic disorder, with relapses and dropouts being considered an important issue, research into these topics is scarce (Ledgerwood & Petry, 2006; Melville, Casey, & Kavanagh, 2007). Systematic revisions on treatment outcome have found that the prevalence of relapses in pathological gambling is very high (Ledgerwood & Petry, 2006) and that dropouts from psychological treatments identified percentages ranging from 14%–50% with a median of 26% (Melville et al., 2007). These data are of great importance if we consider that the differentiation between lapse and relapse is one of the most useful concepts for the study of PG. When abstinence has been the goal of the treatment, lapse is considered as a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode. In our study, we used an operationalization of the concept of loss of control, adding a quantitative criterion: a total expense higher than a week of gambling prior to entering treatment.

In their review, Ledgerwood and Petry (2006) also posited that the differentiation between lapse and relapse is one of the most useful concepts for the study of PG. When abstinence has been the goal of the treatment, lapse is considered as a single gambling episode after a period of abstinence that does not involve an ongoing or prolonged loss of control beyond the episode. In our study, we used an operationalization of the concept of loss of control, adding a quantitative criterion: a total expense higher than a week of gambling prior to entering treatment.

In the current research, we tried to overcome some of the limitations of the previous literature by (a) assessing personality with the FFM as one of the models that has received most consensus, (b) using an operational definition of treatment outcome, and (c) assessing participants who were categorized under the same type of gambling. The aim of the present study was to determine which NEO PI–R personality domains would predict relapse and dropout in treatment-seeking slot-machine PGs after 1-year follow-up. To our knowledge, no study has to date investigated the relationship between the NEO PI–R domains and treatment outcome in PG. Our specific objectives were, first, to determine which personality domains were characteristic of those who relapsed and those who dropped out and, second, to establish which personality domains predicted treatment outcome defined as relapse or as dropout.

Method

Participants

The convenience sample consisted of 73 consecutive adult slot-machine PG outpatients (94.5% men) who sought treatment at the Pathological Gambling Unit of the Consorci Sanitari de Terrassa during the period from January 2007 to October 2010. Patients were White and ranged in age from 21 to 73 years ($M_{\text{age}} = 39.32$, $SD = 10.34$). PG was diagnosed with a semi-structured interview (45 min) in accordance to DSM–IV–TR diagnostic criteria for PG. The mean number of DSM–IV–TR criteria for PG met during the previous 3 months was 7.1 ($SD = 1.46$). In addition to slot machines, participants engaged in others forms of gambling: 19.2% bingo; 12.3% table games played at casinos; 9.6% lotteries; and 2.8% Internet gambling. More than half of the sample (63.6%) presented comorbid psychopathology: 22.3% had a mood disorder...
(12.5% primarily dysthymic disorder); 7% had an anxiety disorder and 5.6% abused or were dependent on alcohol.

**Instruments**

Before beginning treatment, participants filled in a sociodemographic questionnaire (age, gender, race, employment and marital status, and years of education) and a lifetime history of gambling (age of onset, duration of the gambling problem, frequency of gambling, and money invested in gambling). Other clinical variables of interest such as use or abuse of illegal substances and pharmacological treatment were also assessed. In addition, in every treatment session and throughout the 12-month follow-up, we collected other clinical variables: Money invested in gambling, lapse (an isolated episode of pathological gambling) or relapse, number of sessions attended and number of times the participant had dropped out.

Personality was assessed using the Spanish version of the NEO PI–R (Costa & McCrae, 1999). This questionnaire is an empirically derived self-report test that assesses five personality domains: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. It consists of 240 items in Likert-type scale of five options (A = strongly disagree; E = strongly agree). NEO PI–R ratings were converted to T scores using the Spanish community norms. In the original study by Costa and McCrae (1992), Cronbach’s alphas ranged from 0.86 (Agreeableness) to 0.92 (Neuroticism), and those of the Spanish adaptation of the NEO PI–R (Costa & McCrae, 1999). This questionnaire is an empirically derived self-report test that assesses five personality domains: Neuroticism, Extraversion, Openness to Experience, Agreeableness, and Conscientiousness. It consists of 240 items in Likert-type scale of five options (A = strongly disagree; E = strongly agree). NEO PI–R ratings were converted to T scores using the Spanish community norms. In the original study by Costa and McCrae (1992), Cronbach’s alphas ranged from 0.86 (Agreeableness) to 0.92 (Neuroticism), and those of the Spanish adaptation ranged from 0.82 (Openness) to 0.90 (Neuroticism; Costa & McCrae, 1999; p. 84).1

**Procedure**

In this naturalistic follow-up study, the criteria for admission were: (a) meeting diagnostic criteria of PG according to the DSM–IV–TR, (b) being 18 years or older, (c) not suffering from any acute or severe psychotic disorder (i.e., acute psychosis, manic episodes, or schizophrenia), and (d) gambling primarily with slot machines. Patients completed the assessment instruments before beginning treatment. All patients attended a protocolized open program treatment consisting of individual cognitive–behavioral therapy for PG aimed at achieving abstinence from gambling. The program was conducted by a clinical psychologist with wide experience in cognitive–behavioral therapy for PGs. Sessions lasted 40 min each, and the techniques used were psychoeducation, motivational interviewing, stimulus control, cognitive restructuring, and relapse prevention.

Twelve months after starting treatment, patients were categorized as abstinent versus relapsed. Relapse was defined as more than two isolated episodes of gambling during the 12-month follow-up or one episode with a loss of control quantified as a total expense higher than that of a week of gambling prior to entering treatment (Echeburúa et al., 2001; Ledgerwood & Petry, 2006). Within the category of those who relapsed, relapses and dropouts were included. Another two categories were generated: PGs who had completed treatment (completers) versus those who had dropped out (dropouts). Premature termination and dropout are used interchangeably in the literature to indicate patients who terminate before the completion of the treatment (Melville et al., 2007). Therefore, dropout was defined as client-initiated termination occurring without discussion with the therapist or when the therapist believes the client is in need of further therapy but the client quits (Sylvain, Ladouceur, & Boisvert, 1997). This approach is generally applied when the treatment program is of an open or unspecified duration. In our PG unit, we used the therapist’s judgment of appropriate termination or a period of abstinence of at least 9 months.

This study was performed according to the Declaration of Helsinki guidelines (Rickham, 1964), and the protocol was approved by the Research Ethics Committee of the Consorci Sanitari de Terrassa. All participants provided written informed consent after receiving a detailed description of the anonymous study and were free to withdraw at any time.

**Data Analyses**

Data analyses followed two steps: descriptive and predictive analyses. In the first step, analyses of frequencies, means, and standard deviations were performed. We tested differences between groups using two-tailed independent Student’s t test and calculated Cohen’s d. To identify significant associations among personality domains, we performed the Pearson correlation. Subsequently, in order to measure the specific contribution of personality domains to treatment outcome (relapse and dropout), we conducted two logistic regression analyses. All the statistical tests were bilateral, and the assumed risk alpha was 5%. We used the statistical package SPSS Version 19.0.

**Results**

The final total sample consisted of 73 participants (94.5% men) fulfilling diagnostic criteria of pathological gambling. Patients had a mean of 9.27 years (SD = 2.67) of education, and 68.5% were employed. Regarding marital status, 61.6% were married, 21.9% were single, and the remaining 16.5% were separated, divorced, or widowers. The mean duration of the gambling problem was 13.65 years (SD = 8.32), and the mean age of onset was 24.64 years (SD = 8.7). Only a few participants (n = 26; 35.6%) were taking psychiatric medication (23.3% selective serotonin reuptake inhibitor antidepressants and 20.5% benzodiazepines). One year after starting treatment, 29% of the patients were abistent, and 48% had completed treatment.

Table 1 shows Pearson correlations among NEO PI–R domain scores. Neuroticism correlated significantly and negatively with Extraversion, Agreeableness, and Conscientiousness. Extraversion correlated significantly and positively with Openness and Conscientiousness. This pattern was similar to that obtained in the Spanish adaptation of the NEO PI–R (Costa & McCrae, 1999).

Age showed a statistically significant positive correlation with Conscientiousness, r = .30, p < .01, and Agreeableness, r = .29, p = .01. Abistent versus relapsed differed on age, t = 2.00, p = .05, Cohen’s d = 0.52, with the abistent group being older (M = 43.05 years; SD = 10.04) than those who had relapsed (M = 37.81 years; SD = 10.17). Completers versus dropouts did not differ on age, t = 1.83, p = .07, Cohen’s d = 0.43. Dropout and relapse were, respectively, independent of age of onset, t = 0.98, p = .33,

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1 The Cronbach’s alphas of our sample could not be determined due to the method of scoring provided by the Spanish distributor.
The purpose of this study was to determine which NEO PI-R personality domains would predict relapse and dropout in a sample of treatment-seeking slot-machine PGs after a 1-year follow-up. To our knowledge, no other studies have examined the association between NEO PI-R domains and treatment outcome in PG.

The clinical and sociodemographic characteristics of our sample were similar to those of samples in other studies conducted in Spain with PGs (Álvarez-Moya et al., 2011; Jiménez-Murcia et al., 2010). Age showed a statistically significant positive correlation with Conscientiousness and Agreeableness, with these associations being consistent with previous literature (Srivastava, John, Gosling, & Potter, 2003). Abstinent patients were on average 6 years older than those who had relapsed. Completers and dropouts did not differ on age, and dropout and relapse were

### Table 1

<table>
<thead>
<tr>
<th>NEO PI-R</th>
<th>N</th>
<th>E</th>
<th>O</th>
<th>A</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>—</td>
<td>—26*</td>
<td>—10</td>
<td>—40**</td>
<td>—41**</td>
</tr>
<tr>
<td>E</td>
<td>—.32</td>
<td>—.48**</td>
<td>—.06</td>
<td>.25*</td>
<td></td>
</tr>
<tr>
<td>O</td>
<td>—.09</td>
<td>.43</td>
<td>—.01</td>
<td>.10</td>
<td></td>
</tr>
<tr>
<td>A</td>
<td>—.36</td>
<td>.19</td>
<td>.11</td>
<td>—.14</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>—.59</td>
<td>.29</td>
<td>.04</td>
<td>.40</td>
<td></td>
</tr>
</tbody>
</table>

Note. Above the diagonal are correlations for pathological gamblers, and below the diagonal are correlations for Spanish adaptation. N = Neuroticism; E = Extraversion; O = Openness to Experience; A = Agreeableness; C = Conscientiousness. Reprinted from Inventario de Personalidad NEO Revisado (NEO PI–R) Inventario y NEO Revisado de Cinco Factores (NEO-FFI) manual profesional by P. T. Costa and R. R. McCrae, 1999, p. 118. Copyrighted 1999 by TEA Ediciones, Madrid, Spain. "p < .05. "**" p < .01.

Table 2

<table>
<thead>
<tr>
<th>NEO PI-R domains</th>
<th>Abstinent (n = 21)</th>
<th>Relapsed (n = 52)</th>
<th>Cohen’s d</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>60.09</td>
<td>8.98</td>
<td>2.33</td>
</tr>
<tr>
<td>E</td>
<td>43.81</td>
<td>11.69</td>
<td>42.71</td>
</tr>
<tr>
<td>O</td>
<td>42.57</td>
<td>10.93</td>
<td>41.46</td>
</tr>
<tr>
<td>A</td>
<td>44.19</td>
<td>10.78</td>
<td>39.38</td>
</tr>
<tr>
<td>C</td>
<td>40.00</td>
<td>9.89</td>
<td>32.69</td>
</tr>
</tbody>
</table>

Note. N = Neuroticism; E = Extraversion; O = Openness to Experience; A = Agreeableness; C = Conscientiousness.
Personality Inventory–Revised in the Abstinent Versus Logistic Regression Analysis Output of Domains of the NEO

Therefore, Neuroticism from the EPI and Neuroticism from the does not include the trait of impulsiveness or that of hostility. Tant methodological differences, Neuroticism was measured by the that in Echeburúa et al.'s (2001) research, apart from other impor-

Logistic regressions analyses. Nevertheless, it is important to note that four of the 30 facet traits measured by the NEO PI–R—impulsiveness (Neuroticism), excitement-seeking (Extraversion), deliberation (Consci-

tiousness), and self-discipline (Conscientiousness)—account for two thirds of the variance in the nine most commonly used measures of impulsivity (Whiteside & Lynam, 2001). In our study, Conscientiousness was a predictor of treatment failure, but Neurotism or Extraversion was not. Bagby et al. (2007) found that the Impulsiveness facet from Neuroticism and the Excitement-Seeking facet from Extraversion were associated with gambling behavior in general, rather than to PG specifically. On the other hand, both Deliberation and Self-Discipline are facets of Consci-

entiousness. Therefore, the Conscientiousness domain has the strongest conceptual links to impulse control as it captures the capacity to resist impulses, manage desires, and apply guiding principles to actively control behavior (Costa & McCrae, 1992). The results obtained in our study also indicated that the Agreea-

bility domain exclusively predicted dropouts.

All in all, it appears that low Conscientiousness could be con-
sidered as a predictor of treatment failure measured by either relapses or dropouts, whereas low Agreeableness seems to be a prognostic domain specifically for dropouts. Patients scoring low Conscientiousness are less likely to make an effort to change their behavior or endure discomfort, although they recognize the benefit of doing so. In therapy, these patients are less likely to work hard, tolerate discomfort, and delay gratification of impulses and desires. Therefore, patients with such characteristics are less likely to benefit from psychotherapy, complete treatment, and have fewer relapses. On the other hand, low scores on Agreeableness may involve skepticism, competitiveness, and reluctance to help others. These attitudes may entail suspicion and an uncooperative attitude toward the treatment offered by the therapist and thus may lead the patient to question the effectiveness of the treatment approach or the competence of the therapist. This may interfere with the formation of a strong alliance, resulting in a greater risk of dropping out of treatment (Ogrodniczuk, Piper, Joyce, McCal-

lum, & Rosie, 2003). Recently, Hirsh, Quilty, Bagby, and McMain (2012) also found that Agreeableness was relevant to the devel-

one of alliance in a sample of patients with borderline personality disorder. In addition, individuals with lower scores on Agree-

bility may be less concerned with the effects of their gambling on others, in particular family members, and therefore they see the requirement of treatment as less important.

Table 3

<table>
<thead>
<tr>
<th>Domains</th>
<th>B</th>
<th>p</th>
<th>Odds ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conscientiousness</td>
<td>-0.11</td>
<td>.01</td>
<td>0.90</td>
<td>[0.84, 0.96]</td>
</tr>
<tr>
<td>Constant</td>
<td>4.80</td>
<td>.01</td>
<td>121.18</td>
<td></td>
</tr>
</tbody>
</table>

Note. Abstinent scored as 0; relapsed scored as 1. CI = confidence interval.

Table 4

<table>
<thead>
<tr>
<th>Domains</th>
<th>B</th>
<th>p</th>
<th>Odds ratio</th>
<th>95% CI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Agreeableness</td>
<td>-0.06</td>
<td>.04</td>
<td>0.94</td>
<td>[0.89, 0.99]</td>
</tr>
<tr>
<td>Conscientiousness</td>
<td>-0.08</td>
<td>.02</td>
<td>0.92</td>
<td>[0.87, 0.99]</td>
</tr>
<tr>
<td>Constant</td>
<td>5.23</td>
<td>.01</td>
<td>186.21</td>
<td></td>
</tr>
</tbody>
</table>

Note. Completers scored as 0; dropouts scored as 1. CI = confidence interval.
Our results need to be considered in light of some limitations. First, all participants were treatment-seeking slot-machine gamblers, which may affect the generalizability of our findings since PGs are not a homogeneous group. Second, most of the patients were men, making it advisable to check for the generalizability of these findings for female PGs. Third, comorbidity was assessed by a clinical interview; therefore, Axis II disorders were not specifically assessed. Finally, several potential confounding factors such as those related to social desirability, demographic differences, or context effects were not controlled.

Our findings support the views held by many clinicians regarding the importance of individual differences in personality on treatment outcome (e.g., Blaszczynski & Nower, 2002; Ledgerwood & Petry, 2010; Milosevic & Ledgerwood, 2010); hence, one cannot expect that theoretically derived treatments would be equally effective on all PGs irrespective of their personality profile. A better understanding of the personality characteristics that place particular individuals at risk of treatment failure is vital to the development of new treatments as well as to the modification of the existing ones. Therefore, an in-depth assessment of personality to identify those at risk would allow clinicians to intervene in the early stages of therapy by applying specific strategies. Furthermore, the tailoring of protocols to suit individual needs and vulnerabilities might provide additional tools to decrease this risk (Daughters, Lejuez, Lesieur, Strong, & Zvolensky, 2003). The NEO PI-R may constitute the most promising instrument for this purpose (Dickerson, Melville, Kavanagh, & Kavanagh, 2007). The Temperament and Character Inventory–Revised (NEO-TCI-R) could complement the NEO PI-R as a tool for identifying individual risky situations that may therefore improve the effectiveness of treatment interventions.

Clinicians might consider PGs with lower Conscientiousness and lower Agreeableness scores as being at risk of prematurely dropping out of treatment. Therefore, those patients with this personality profile would benefit from an increase in the number of sessions of psychological treatments strongly emphasizing motivational enhancement and dropout prevention (Myrseth et al., 2009). Future investigations addressing the issues we have raised are needed for therapists to understand and decrease treatment failure for PG. All of this knowledge may contribute to tailoring treatment programs to PGs with different personality profiles.

References


Received July 13, 2012
Revision received January 14, 2013
Accepted January 16, 2013